

**RETURN BIDS TO:  
RETOURNER LES SOUMISSIONS À:**

**Bid Receiving  
PWGSC  
33 City Centre Drive  
Suite 480  
Mississauga  
Ontario  
L5B 2N5  
Bid Fax: (905) 615-2095**

**REQUEST FOR PROPOSAL  
DEMANDE DE PROPOSITION**

**Proposal To: Public Works and Government  
Services Canada**

We hereby offer to sell to Her Majesty the Queen in right of Canada, in accordance with the terms and conditions set out herein, referred to herein or attached hereto, the goods, services, and construction listed herein and on any attached sheets at the price(s) set out therefor.

**Proposition aux: Travaux Publics et Services  
Gouvernementaux Canada**

Nous offrons par la présente de vendre à Sa Majesté la Reine du chef du Canada, aux conditions énoncées ou incluses par référence dans la présente et aux annexes ci-jointes, les biens, services et construction énumérés ici sur toute feuille ci-annexée, au(x) prix indiqué(s).

**Comments - Commentaires**

<b>Title - Sujet</b> Training and Curriculum Development	
<b>Solicitation No. - N° de l'invitation</b> W0113-12JB01/A	<b>Date</b> 2012-12-07
<b>Client Reference No. - N° de référence du client</b> W0113-12JB01	
<b>GETS Reference No. - N° de référence de SEAG</b> PW-\$TOR-212-6114	
<b>File No. - N° de dossier</b> TOR-2-35223 (212)	<b>CCC No./N° CCC - FMS No./N° VME</b>
<b>Solicitation Closes - L'invitation prend fin</b> <b>at - à 02:00 PM</b> <b>on - le 2013-01-21</b>	
<b>Time Zone</b> <b>Fuseau horaire</b> Eastern Standard Time EST	
<b>F.O.B. - F.A.B.</b> <b>Plant-Usine:</b> <input type="checkbox"/> <b>Destination:</b> <input checked="" type="checkbox"/> <b>Other-Autre:</b> <input type="checkbox"/>	
<b>Address Enquiries to: - Adresser toutes questions à:</b> Shaw, Marian	<b>Buyer Id - Id de l'acheteur</b> tor212
<b>Telephone No. - N° de téléphone</b> (905) 615-2065 ( )	<b>FAX No. - N° de FAX</b> (905) 615-2060
<b>Destination - of Goods, Services, and Construction:</b> <b>Destination - des biens, services et construction:</b> DEPARTMENT OF NATIONAL DEFENCE CFB Borden 30 Ortona Road - Bldg O-166 Borden Ontario L0M1C0 Canada	

**Instructions: See Herein**

**Instructions: Voir aux présentes**

**Vendor/Firm Name and Address**

**Raison sociale et adresse du  
fournisseur/de l'entrepreneur**

**Issuing Office - Bureau de distribution**

Public Works and Government Services Canada  
Ontario Region  
33 City Centre Drive  
Suite 480  
Mississauga  
Ontario  
L5B 2N5

<b>Delivery Required - Livraison exigée</b> See Herein	<b>Delivery Offered - Livraison proposée</b>
<b>Vendor/Firm Name and Address</b> <b>Raison sociale et adresse du fournisseur/de l'entrepreneur</b>	
<b>Telephone No. - N° de téléphone</b> <b>Facsimile No. - N° de télécopieur</b>	
<b>Name and title of person authorized to sign on behalf of Vendor/Firm</b> <b>(type or print)</b> <b>Nom et titre de la personne autorisée à signer au nom du fournisseur/ de l'entrepreneur (taper ou écrire en caractères d'imprimerie)</b>	
<b>Signature</b>	<b>Date</b>

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## PART 1 - GENERAL INFORMATION

### 1. Security Requirement

There is no security requirement associated with the requirement.

### 2. Statement of Work

The Work to be performed is detailed under Article 2 of the resulting contract clauses.

### 3. Debriefings

After contract award, bidders may request a debriefing on the results of the bid solicitation process. Bidders should make the request to the Contracting Authority within 15 working days of receipt of the results of the bid solicitation process. The debriefing may be in writing, by telephone or in person.

## PART 2 - BIDDER INSTRUCTIONS

### 1. Standard Instructions, Clauses and Conditions

All instructions, clauses and conditions identified in the bid solicitation by number, date and title are set out in the *Standard Acquisition Clauses and Conditions Manual* (<https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual>) issued by Public Works and Government Services Canada.

Bidders who submit a bid agree to be bound by the instructions, clauses and conditions of the bid solicitation and accept the clauses and conditions of the resulting contract.

The 2003 (2012-11-19) Standard Instructions - Goods or Services - Competitive Requirements, are incorporated by reference into and form part of the bid solicitation.

Subsection 5.4 of 2003, Standard Instructions - Goods or Services - Competitive Requirements, is amended as follows:

Delete: sixty (60) days  
Insert: ninety (90) days

### 2. Submission of Bids

Bids must be submitted only to Public Works and Government Services Canada (PWGSC) Bid Receiving Unit by the date, time and place indicated on page 1 of the bid solicitation.

**Due to the nature of the bid solicitation, bids transmitted by facsimile to PWGSC will not be accepted.**

### 3. Enquiries - Bid Solicitation

All enquiries must be submitted in writing to the Contracting Authority no later than ten (10) calendar days before the bid closing date. Enquiries received after that time may not be answered.

Bidders should reference as accurately as possible the numbered item of the bid solicitation to which the enquiry relates. Care should be taken by bidders to explain each question in sufficient detail in order to

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enable Canada to provide an accurate answer. Technical enquiries that are of a proprietary nature must be clearly marked "proprietary" at each relevant item. Items identified as "proprietary" will be treated as such except where Canada determines that the enquiry is not of a proprietary nature. Canada may edit the questions or may request that the Bidder do so, so that the proprietary nature of the question is eliminated, and the enquiry can be answered with copies to all bidders. Enquiries not submitted in a form that can be distributed to all bidders may not be answered by Canada.

#### 4. Applicable Laws

Any resulting contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in Ontario.

Bidders may, at their discretion, substitute the applicable laws of a Canadian province or territory of their choice without affecting the validity of their bid, by deleting the name of the Canadian province or territory specified and inserting the name of the Canadian province or territory of their choice. If no change is made, it acknowledges that the applicable laws specified are acceptable to the bidders.

### PART 3 - BID PREPARATION INSTRUCTIONS

#### 1. Bid Preparation Instructions

Canada requests that bidders provide their bid in separately bound sections as follows:

Section I: Technical Bid (3 hard copies)

Section II: Financial Bid (2 hard copies)

Section III: Certifications (1 hard copies)

Prices must appear in the financial bid only. No prices must be indicated in any other section of the bid.

Canada requests that bidders follow the format instructions described below in the preparation of their bid:

- (a) use 8.5 x 11 inch (216 mm x 279 mm) paper;
- (b) use a numbering system that corresponds to the bid solicitation.

In April 2006, Canada issued a policy directing federal departments and agencies to take the necessary steps to incorporate environmental considerations into the procurement process [Policy on Green Procurement](http://www.tpsgc-pwgsc.gc.ca/ecologisation-greening/achats-procurement/politique-policy-eng.html) (<http://www.tpsgc-pwgsc.gc.ca/ecologisation-greening/achats-procurement/politique-policy-eng.html>). To assist Canada in reaching its objectives, bidders should:

- 1) use 8.5 x 11 inch (216 mm x 279 mm) paper containing fibre certified as originating from a sustainably-managed forest and containing minimum 30% recycled content; and
- 2) use an environmentally-preferable format including black and white printing instead of colour printing, printing double sided/duplex, using staples or clips instead of cerlox, duotangs or binders.

#### Section I: Technical Bid

In their technical bid, bidders should explain and demonstrate how they propose to meet the requirements and how they will carry out the Work.

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**Section II: Financial Bid**

Bidders must submit their financial bid in accordance with the Basis of Payment. The total amount of Goods and Services Tax (GST) or Harmonized Sales Tax (HST) must be shown separately, if applicable.

**Section III: Certifications**

Bidders must submit the certifications required under Part 5.

**PART 4 - EVALUATION PROCEDURES AND BASIS OF SELECTION****1. Evaluation Procedures**

- (a) Bids will be assessed in accordance with the entire requirement of the bid solicitation including the technical and financial evaluation criteria.
- (b) An evaluation team composed of representatives of Canada will evaluate the bids.

**1.1 Technical Evaluation****1.1.1 Mandatory Technical Criteria**

See Annex C - Evaluation Criteria

**1.1.2 Point Rated Technical Criteria**

See Annex C - Evaluation Criteria

**1.2 Financial Evaluation****1.2.1 Mandatory Financial Criteria**

The Bidder must submit pricing in accordance with Annex B, Basis of Payment. Pricing must be provided in Canadian funds for the firm and optional requirements.

**1.2.2 Evaluation of Price**

The price of the bid will be evaluated in Canadian dollars, the Goods and Services Tax or the Harmonized Sales Tax excluded, FOB destination, Canadian customs duties and excise taxes included.

- 1.2.3** The price will be evaluated in accordance with Annex D, Calculation of Price for Evaluation Purposes. The evaluated price will be the Total Aggregate Price for the entire requirement which will be calculated using the sum of the total price for the firm and optional requirements.

**2. Basis of Selection****2.1 Basis of Selection - Lowest Price Per Point**

- 1. To be declared responsive, a bid must:
  - a. comply with all the requirements of the bid solicitation;
  - b. meet all mandatory technical evaluation criteria; and

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- c. obtain the required minimum of 60 percent overall of the points for the technical evaluation criteria which are subject to point rating. The rating is performed on a scale of 240 points.
  2. Bids not meeting (a) or (b) or (c) will be declared non-responsive. Neither the responsive bid that receives the highest number of points nor the one that proposed the lowest price will necessarily be accepted. The responsive bid with the lowest evaluated price per point will be recommended for award of a contract.

## **PART 5 - CERTIFICATIONS**

Bidders must provide the required certifications and related documentation to be awarded a contract. Canada will declare a bid non-responsive if the required certifications and related documentation are not completed and submitted as requested.

Compliance with the certifications bidders provide to Canada is subject to verification by Canada during the bid evaluation period (before award of a contract) and after award of a contract. The Contracting Authority will have the right to ask for additional information to verify bidders' compliance with the certifications before award of a contract. The bid will be declared non-responsive if any certification made by the Bidder is untrue, whether made knowingly or unknowingly. Failure to comply with the certifications, to provide the related documentation or to comply with the request of the Contracting Authority for additional information will also render the bid non-responsive.

### **1. Mandatory Certifications Required Precedent to Contract Award**

#### **1.1 Code of Conduct and Certifications - Related documentation**

- 1.1.1 By submitting a bid, the Bidder certifies, for himself and his affiliates, to be in compliance with the Code of Conduct and Certifications clause of the Standard instructions. The related documentation hereinafter mentioned will help Canada in confirming that the certifications are true. By submitting a bid, the Bidder certifies that it is aware, and that its affiliates are aware, that Canada may request additional information, certifications, consent forms and other evidentiary elements proving identity or eligibility. Canada may also verify the information provided by the Bidder, including the information relating to the acts or convictions specified herein, through independent research, use of any government resources or by contacting third parties. Canada will declare non-responsive any bid in respect of which the information requested is missing or inaccurate, or in respect of which the information contained in the certifications is found to be untrue, in any respect, by Canada. The Bidder and any of the Bidder's affiliates, will also be required to remain free and clear of any acts or convictions specified herein during the period of any contract arising from this bid solicitation.

Bidders who are incorporated, including those bidding as a joint venture, must provide with their bid or promptly thereafter a complete list of names of all individuals who are currently directors of the Bidder. Bidders bidding as sole proprietorship, including those bidding as a joint venture, must provide the name of the owner with their bid or promptly thereafter. Bidders bidding as societies, firms, partnerships or associations of persons do not need to provide lists of names. If the required names have not been received by the time the evaluation of bids is completed, Canada will inform the Bidder of a time frame within which to provide the information. Failure to comply will render the bid non-responsive. Providing the required names is a mandatory requirement for contract award.

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Canada may, at any time, request that a Bidder provide properly completed and Signed Consent Forms (Consent to a Criminal Record Verification form- PWGSC-TPSGC 229) (<http://www.tpsgc-pwgsc.gc.ca/app-acq/forms/formulaires-forms-eng.html>) for any or all individuals aforementioned within the time specified. Failure to provide such Consent Forms within the time period provided will result in the bid being declared non-responsive.

## **2. Additional Certifications Precedent to Contract Award**

The certifications listed below should be completed and submitted with the bid, but may be submitted afterwards. If any of these required certifications is not completed and submitted as requested, the Contracting Authority will so inform the Bidder and provide the Bidder with a time frame within which to meet the requirement. Failure to comply with the request of the Contracting Authority and meet the requirement within that time period will render the bid non-responsive.

### **2.1 Federal Contractors Program - Certification**

#### **2.1.1 Federal Contractors Program - \$200,000 or more**

1. The Federal Contractors Program (FCP) requires that some suppliers, including a supplier who is a member of a joint venture, bidding for federal government contracts, valued at \$200,000 or more (including all applicable taxes), make a formal commitment to implement employment equity. This is a condition precedent to contract award. If the Bidder, or, if the Bidder is a joint venture and if any member of the joint venture, is subject to the FCP, evidence of its commitment must be provided before the award of the Contract.

Suppliers who have been declared ineligible contractors by Human Resources and Skills Development Canada (HRSDC) are no longer eligible to receive government contracts over the threshold for solicitation of bids as set out in the Government Contracts Regulations. Suppliers may be declared ineligible contractors either as a result of a finding of non-compliance by HRSDC, or following their voluntary withdrawal from the FCP for a reason other than the reduction of their workforce to less than 100 employees. Any bids from ineligible contractors, including a bid from a joint venture that has a member who is an ineligible contractor, will be declared non-responsive.

2. If the Bidder does not fall within the exceptions enumerated in 3.(a) or (b) below, or does not have a valid certificate number confirming its adherence to the FCP, the Bidder must fax (819-953-8768) a copy of the signed form LAB 1168, Certificate of Commitment to Implement Employment Equity, to the Labour Branch of HRSDC.
3. The Bidder, or, if the Bidder is a joint venture the member of the joint venture, certifies its status with the FCP, as follows:

The Bidder or the member of the joint venture

- a. ( ) is not subject to the FCP, having a workforce of less than 100 full-time or part-time permanent employees, and/or temporary employees having worked 12 weeks or more in Canada;
- b. ( ) is not subject to the FCP, being a regulated employer under the Employment Equity Act, S.C. 1995, c. 44;
- c. ( ) is subject to the requirements of the FCP, having a workforce of 100 or more full-time or part-time permanent employees, and/or temporary employees having worked 12 weeks or more in Canada, but has not previously obtained a certificate number from

HRSDC (having not bid on requirements of \$200,000 or more), in which case a duly signed certificate of commitment is attached;

- d. ( ) is subject to the FCP, and has a valid certificate number as follows: \_\_\_\_\_ (e.g. has not been declared an ineligible contractor by HRSDC).

Further information on the FCP is available on the HRSDC Web site.

## 2.2 Former Public Servant Certification

### 2.2.1 Former Public Servant - Competitive Requirements

Contracts with former public servants (FPS) in receipt of a pension or of a lump sum payment must bear the closest public scrutiny, and reflect fairness in the spending of public funds. In order to comply with Treasury Board policies and directives on contracts with FPS, bidders must provide the information required below.

#### Definitions

For the purposes of this clause, "former public servant" is any former member of a department as defined in the Financial Administration Act, R.S., 1985, c. F-11, a former member of the Canadian Armed Forces or a former member of the Royal Canadian Mounted Police. A former public servant may be:

- a. an individual;
- b. an individual who has incorporated;
- c. a partnership made of former public servants; or
- d. a sole proprietorship or entity where the affected individual has a controlling or major interest in the entity.

"lump sum payment period" means the period measured in weeks of salary, for which payment has been made to facilitate the transition to retirement or to other employment as a result of the implementation of various programs to reduce the size of the Public Service. The lump sum payment period does not include the period of severance pay, which is measured in a like manner.

"pension" means, a pension or annual allowance paid under the Public Service Superannuation Act (PSSA), R.S., 1985, c.P-36, and any increases paid pursuant to the Supplementary Retirement Benefits Act, R.S., 1985, c.S-24 as it affects the PSSA. It does not include pensions payable pursuant to the Canadian Forces Superannuation Act, R.S., 1985, c.C-17, the Defence Services Pension Continuation Act, 1970, c.D-3, the Royal Canadian Mounted Police Pension Continuation Act, 1970, c.R-10, and the Royal Canadian Mounted Police Superannuation Act, R.S., 1985, c.R-11, the Members of Parliament Retiring Allowances Act, R.S., 1985, c.M-5, and that portion of pension payable to the Canada Pension Plan Act, R.S., 1985, c.C-8.

#### Former Public Servant in Receipt of a Pension

As per the above definitions, is the Bidder a FPS in receipt of a pension? **Yes ( ) No ( )**

If so, the Bidder must provide the following information, for all FPS in receipt of a pension, as applicable:

- a. name of former public servant;
- b. date of termination of employment or retirement from the Public Service.

By providing this information, Bidders agree that the successful Bidder's status, with respect to being a former public servant in receipt of a pension, will be reported on departmental websites as part of the published proactive disclosure reports in accordance with Contracting Policy Notice: 2012-2 and the Guidelines on the Proactive Disclosure of Contracts.

**Work Force Reduction Program**

Is the Bidder a FPS who received a lump sum payment pursuant to the terms of a work force reduction program? Yes ( ) No ( )

If so, the Bidder must provide the following information:

- a. name of former public servant;
- b. conditions of the lump sum payment incentive;
- c. date of termination of employment;
- d. amount of lump sum payment;
- e. rate of pay on which lump sum payment is based;
- f. period of lump sum payment including start date, end date and number of weeks;
- g. number and amount (professional fees) of other contracts subject to the restrictions of a work force reduction program.

For all contracts awarded during the lump sum payment period, the total amount of fees that may be paid to a FPS who received a lump sum payment is \$5,000, including the Goods and Services Tax or Harmonized Sales Tax.

**2.3 Status and Availability of Resources**

The Bidder certifies that, should it be awarded a contract as a result of the bid solicitation, every individual proposed in its bid will be available to perform the Work as required by Canada's representatives and at the time specified in the bid solicitation or agreed to with Canada's representatives. If for reasons beyond its control, the Bidder is unable to provide the services of an individual named in its bid, the Bidder may propose a substitute with similar qualifications and experience. The Bidder must advise the Contracting Authority of the reason for the substitution and provide the name, qualifications and experience of the proposed replacement. For the purposes of this clause, only the following reasons will be considered as beyond the control of the Bidder: death, sickness, maternity and parental leave, retirement, resignation, dismissal for cause or termination of an agreement for default.

If the Bidder has proposed any individual who is not an employee of the Bidder, the Bidder certifies that it has the permission from that individual to propose his/her services in relation to the Work to be performed and to submit his/her résumé to Canada. The Bidder must, upon request from the Contracting Authority, provide a written confirmation, signed by the individual, of the permission given to the Bidder and of his/her availability. Failure to comply with the request may result in the bid being declared non-responsive.

**2.4 Education and Experience****2.4.1 SACC Manual clause A3010T (2010-08-16) Education and Experience****PART 6 - RESULTING CONTRACT CLAUSES****1. Security Requirement**

There is no security requirement associated with the requirement.

**2. Statement of Work**

The Contractor must perform the Work in accordance with the Statement of Work at Annex A and the technical and management portions of the Contractor's bid entitled \_\_\_\_\_, dated \_\_\_\_\_.

## 2.1 Optional Goods and/or Services

The Contractor grants to Canada the irrevocable option to acquire the goods, services or both described at Annex A and Annex B of the Contract under the same conditions and at the prices and/or rates stated in the Contract. The option may only be exercised by the Contracting Authority and will be evidenced, for administrative purposes only, through a contract amendment.

The Contracting Authority may exercise the option at any time before the expiry of the Contract by sending a written notice to the Contractor.

## 3. Standard Clauses and Conditions

All clauses and conditions identified in the Contract by number, date and title are set out in the *Standard Acquisition Clauses and Conditions Manual*

(<https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual>) issued by Public Works and Government Services Canada.

### 3.1 General Conditions

2010B (2012-11-10), General Conditions - Professional Services (Medium Complexity) apply to and form part of the Contract.

### 3.2 Supplemental General Conditions

4006 (2010-08-16) Contractor to Own Intellectual Property Rights in Foreground Information, apply to and form part of the Contract.

## 4. Term of Contract

### 4.1 Period of the Contract

The period of the Contract is from date of Contract to 27 May 2015 inclusive.

### 4.2 Delivery Date

#### 4.2.1 Firm Requirement

Training must be provided from 11 February 2013 to 10 May 2013 inclusive.

#### 4.2.2 Optional Requirement

Training must be provided during the specified period as detailed at Annex B, Optional Requirement.

## 5. Authorities

### 5.1 Contracting Authority

The Contracting Authority for the Contract is:

Marian Shaw  
Supply Specialist  
Public Works and Government Services Canada  
Ontario Region - Acquisitions  
33 City Centre Dr., Mississauga, ON L5B 2N5

Solicitation No. - N° de l'invitation

Amd. No. - N° de la modif.

Buyer ID - Id de l'acheteur

W0113-12JB01/A

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Client Ref. No. - N° de réf. du client

File No. - N° du dossier

CCC No./N° CCC - FMS No/ N° VME

W0113-12JB01

TOR-2-35223

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Telephone : 905-615-2065  
Facsimile: 905-615-2060  
E-mail address: marian.shaw@pwgsc.gc.ca

The Contracting Authority is responsible for the management of the Contract and any changes to the Contract must be authorized in writing by the Contracting Authority. The Contractor must not perform work in excess of or outside the scope of the Contract based on verbal or written requests or instructions from anybody other than the Contracting Authority.

## 5.2 Project Authority

The Project Authority for the Contract is:

*(To be completed by Canada at contract award).*

The Project Authority is the representative of the department or agency for whom the Work is being carried out under the Contract and is responsible for all matters concerning the technical content of the Work under the Contract. Technical matters may be discussed with the Project Authority, however the Project Authority has no authority to authorize changes to the scope of the Work. Changes to the scope of the Work can only be made through a contract amendment issued by the Contracting Authority.

## 5.3 Contractor's Representative *(To be completed by the Bidder).*

Name: \_\_\_\_\_  
Title: \_\_\_\_\_  
Organization: \_\_\_\_\_  
Address: \_\_\_\_\_

Telephone : \_\_\_\_\_  
Facsimile: \_\_\_\_\_  
E-mail address: \_\_\_\_\_

## 6. Payment

### 6.1 Basis of Payment - Limitation of Expenditure

The Contractor will be reimbursed for the costs reasonably and properly incurred in the performance of the Work, as determined in accordance with the Basis of Payment in Annex B , to a limitation of expenditure of \$\_\_\_\_\_ (*amount to be inserted at contract award*). Customs duties are included and Goods and Services Tax or Harmonized Sales Tax is extra, if applica

### 6.2 Limitation of Expenditure

1. Canada's total liability to the Contractor under the Contract must not exceed \$\_\_\_\_\_ (*amount to be inserted at contract award*) . Customs duties are included and Goods and Services Tax or Harmonized Sales Tax is extra, if applicable.
2. No increase in the total liability of Canada or in the price of the Work resulting from any design changes, modifications or interpretations of the Work, will be authorized or paid to the Contractor unless these design changes, modifications or interpretations have been approved, in writing, by the Contracting Authority before their incorporation into the Work. The Contractor must not perform any work or provide any service that would result in Canada's total liability being exceeded before obtaining the written approval of the Contracting Authority. The Contractor must notify the Contracting Authority in writing as to the adequacy of this sum:

- a. when it is 75 percent committed, or
- b. four (4) months before the contract expiry date, or
- c. as soon as the Contractor considers that the contract funds provided are inadequate for the completion of the Work,

whichever comes first.

3. If the notification is for inadequate contract funds, the Contractor must provide to the Contracting Authority a written estimate for the additional funds required. Provision of such information by the Contractor does not increase Canada's liability.

### **6.3 Progress Payments**

1. Canada will make progress payments in accordance with the payment provisions of the Contract, no more than once a month, for cost incurred in the performance of the Work, up to 90 percent of the amount claimed and approved by Canada if:
  - a. an accurate and complete claim for payment using form PWGSC-TPSGC 1111, Claim for Progress Payment, and any other document required by the Contract have been submitted in accordance with the invoicing instructions provided in the Contract;
  - b. the amount claimed is in accordance with the basis of payment;
  - c. the total amount for all progress payments paid by Canada does not exceed 90 percent of the total amount to be paid under the Contract;
  - d. all certificates appearing on form PWGSC-TPSGC 1111 have been signed by the respective authorized representatives.
2. The balance of the amount payable will be paid in accordance with the payment provisions of the Contract upon completion and delivery of all work required under the Contract if the Work has been accepted by Canada and a final claim for the payment is submitted.
3. Progress payments are interim payments only. Canada may conduct a government audit and interim time and cost verifications and reserves the rights to make adjustments to the Contract from time to time during the performance of the Work. Any overpayment resulting from progress payments or otherwise must be refunded promptly to Canada.

### **6.4 T1204 - Information Reporting by Contractor**

1. Pursuant to paragraph 221 (1)(d) of the Income Tax Act, R.S. 1985, c.1 (5th Supp.), payments made by departments and agencies to contractors under applicable services contracts (including contracts involving a mix of goods and services) must be reported on a T1204 Government Service Contract Payments slip.
2. To enable departments and agencies to comply with this requirement, the Contractor must provide the following information within 10 calendar days following contract award:
  - a. the legal name of the Contractor, i.e. the legal name associated with its business number or Social Insurance Number (SIN), as well as its address and postal code;
  - b. the status of the Contractor, i.e. an individual, a sole proprietorship, a corporation, or a partnership;
  - c. the business number of the Contractor if the Contractor is a corporation or a partnership and the SIN if the Contractor is an individual or a sole proprietorship. In the case of a partnership, if the partnership does not have a business number, the partner who has signed the Contract must provide its SIN;

- d. in the case of a joint venture, the business number of all parties to the joint venture who have a business number or their SIN if they do not have a business number.
3. The information must be sent to the person and address specified below. If the information includes a SIN, the information should be provided in an envelope marked "protected".

Name of person (*To be provided at contract award*)

## **6.5 SACC Manual Clauses**

C0710C (2007-11-30) Time and Contract Price Verification

## **7. Invoicing Instructions**

### **7.1 Invoicing Instructions - Progress Payment Claim**

1. The Contractor must submit a claim for payment using form PWGSC-TPSGC 1111, Claim for Progress Payment.

Each claim must show:

- a. all information required on form PWGSC-TPSGC 1111;
- b. all applicable information detailed under the section entitled "Invoice Submission" of the general conditions;

Each claim must be supported by:

- a. a copy of time sheets to support the time claimed;
  - b. a copy of the invoices, receipts, vouchers for all direct expenses, travel and living expenses;
2. The Goods and Services Tax or Harmonized Sales Tax (GST/HST), as applicable, must be calculated on the total amount of the claim before the holdback is applied. At the time the holdback is claimed, there will be no GST/HST payable as it was claimed and payable under the previous claims for progress payments.
3. The Contractor must prepare and certify one original and two (2) copies of the claim on form PWGSC-TPSGC 1111, and forward it to the Project Authority identified under the section entitled "Authorities" of the Contract for appropriate certification after inspection and acceptance of the Work takes place.

The Project Authority will then forward the original and two (2) copies of the claim to the Contracting Authority for certification and onward submission to the Payment Office for the remaining certification and payment action.

4. The Contractor must not submit claims until all work identified in the claim is completed.

## **8. Certifications**

### **8.1 Compliance**

Compliance with the certifications and related documentation provided by the Contractor in its bid is a condition of the Contract and subject to verification by Canada during the term of the Contract. If the Contractor does not comply with any certification, provide the related documentation or if it is determined

that any certification made by the Contractor in its bid is untrue, whether made knowingly or unknowingly, Canada has the right, pursuant to the default provision of the Contract, to terminate the Contract for default.

### 9. **Applicable Laws**

The Contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in Ontario.

### 10. **Priority of Documents**

If there is a discrepancy between the wording of any documents that appear on the list, the wording of the document that first appears on the list has priority over the wording of any document that subsequently appears on the list.

- (a) the Articles of Agreement;
- (b) the supplemental general conditions 4006 (2010-08-16) Contractor to Own Intellectual Property Rights in Foreground Information;
- (c) the general conditions 2010B (2012-11-19) General Conditions - Professional Services (Medium Complexity);
- (d) Annex A, Statement of Work;
- (e) Annex B, Basis of Payment;
- (f) the Contractor's bid dated \_\_\_\_\_,

### 11. **SACC Manual Clauses**

A9062 (2011-05-16) Canadian Forces Site Regulations  
A7017C (2008-05-12) Replacement of Specific Individuals

### 12. **Insurance**

SACC Manual clause G1005C (2008-05-12) Insurance

### 13. **Specific Person(s)**

The Contractor must provide the services of the following person(s) to perform the Work as stated in the Contract: *(insert name(s) of person(s). (To be filled in at contract award and as designated by the Bidder)*

Instructor 1 \_\_\_\_\_

Instructor 2 \_\_\_\_\_ *(if applicable)*

Solicitation No. - N° de l'invitation

W0113-12JB01/A

Amd. No. - N° de la modif.

File No. - N° du dossier

TOR-2-35223

Buyer ID - Id de l'acheteur

tor212

CCC No./N° CCC - FMS No/ N° VME

W0113-12JB01

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## **ANNEX A**

### **STATEMENT OF WORK (SOW)**

Document attached.

## ANNEX B BASIS OF PAYMENT

### FIRM REQUIREMENT - Year 1

#### 1. Lesson Plans

The Contractor will be paid a firm lot price of \$\_\_\_\_\_ for the preparation, submission and acceptance of the Lesson Plans.

#### 2. Labour Rates - Instructors (11 February 2013 to 10 May 2013)

The following are firm rates for all categories of resources listed below.

Item	Category	Firm Per Diem Rate	Total
2.1	Instructor Based on one (1) instructor for sixty-three (63) working days	\$_____	\$_____

#### Definition of a Day/Proration

A day is defined as 7.5 hours exclusive of meal breaks. Payment will be for days actually worked with no provision for annual leave, statutory holidays and sick leave. Time worked which is more or less than a day will be prorated to reflect actual time worked in accordance with the following formula:

Hours worked: 7.5 x per diem rate

#### 3. Travel and Living Expenses

The Contractor will be reimbursed its authorized travel and living expenses reasonably and properly incurred in the performance of the Work, at cost, without any allowance for profit and/or administrative overhead, in accordance with the meal, private vehicle and incidental expenses provided in Appendices B, C and D of the Treasury Board Travel Directive, and with the other provisions of the directive referring to "travellers", rather than those referring to "employees".

All travel must have the prior authorization of the Project Authority.

All payments are subject to government audit.

Estimated Cost: \$\_\_\_\_\_ (HST extra)

#### 4. Other Expenses

Other expenses *(to be filled in at contract)*

TOTAL ESTIMATED COST AND LIMITATION OF EXPENDITURE \$\_\_\_\_\_ *(to be filled in at contract award)*

**OPTIONAL REQUIREMENT - Year 2****1. Lesson Plans**

The Contractor will be paid a firm lot price of \$ \_\_\_\_\_ for the preparation, submission and acceptance of the Lesson Plans.

**2. Labour Rates - Instructors (3 February 2014 to 28 May 2014)**

The following are firm rates for all categories of resources listed below.

Item	Category	Firm Per Diem Rate	Total
2.1	Instructor Based on one (1) instructor for sixty-three (63) working days	\$ _____	\$ _____

Definition of a Day/Proration

A day is defined as 7.5 hours exclusive of meal breaks. Payment will be for days actually worked with no provision for annual leave, statutory holidays and sick leave. Time worked which is more or less than a day will be prorated to reflect actual time worked in accordance with the following formula:

Hours worked: 7.5 x per diem rate

**3. Travel and Living Expenses**

The Contractor will be reimbursed its authorized travel and living expenses reasonably and properly incurred in the performance of the Work, at cost, without any allowance for profit and/or administrative overhead, in accordance with the meal, private vehicle and incidental expenses provided in Appendices B, C and D of the Treasury Board Travel Directive, and with the other provisions of the directive referring to "travellers", rather than those referring to "employees".

All travel must have the prior authorization of the Project Authority.

All payments are subject to government audit.

Estimated Cost: \$ \_\_\_\_\_ (HST extra)

**4. Other Expenses**

Other expenses *(to be filled in at contract)*

TOTAL ESTIMATED COST AND LIMITATION OF EXPENDITURE \$ \_\_\_\_\_ *(to be filled in at contract award)*

**OPTIONAL REQUIREMENT - Year 3****1. Lesson Plans**

The Contractor will be paid a firm lot price of \$ \_\_\_\_\_ for the preparation, submission and acceptance of the Lesson Plans.

**2. Labour Rates - Instructors (2 February 2015 to 27 May 2015)**

The following are firm rates for all categories of resources listed below.

Item	Category	Firm Per Diem Rate	Total
2.1	Instructor Based on one (1) instructor for sixty-three (63) working days	\$ _____	\$ _____

Definition of a Day/Proration

A day is defined as 7.5 hours exclusive of meal breaks. Payment will be for days actually worked with no provision for annual leave, statutory holidays and sick leave. Time worked which is more or less than a day will be prorated to reflect actual time worked in accordance with the following formula:

Hours worked: 7.5 x per diem rate

**3. Travel and Living Expenses**

The Contractor will be reimbursed its authorized travel and living expenses reasonably and properly incurred in the performance of the Work, at cost, without any allowance for profit and/or administrative overhead, in accordance with the meal, private vehicle and incidental expenses provided in Appendices B, C and D of the Treasury Board Travel Directive, and with the other provisions of the directive referring to "travellers", rather than those referring to "employees".

All travel must have the prior authorization of the Project Authority.

All payments are subject to government audit.

Estimated Cost: \$ \_\_\_\_\_ (HST extra)

**4. Other Expenses**

Other expenses *(to be filled in at contract)*

TOTAL ESTIMATED COST AND LIMITATION OF EXPENDITURE \$ \_\_\_\_\_ *(to be filled in at contract award)*

## ANNEX C EVALUATION CRITERIA

### 1.1.1 Mandatory Technical Criteria

Bidders must provide proof of authority from the bidders Provincial Ministry of Education, or be partnered with an institution having that authority, such as that the bidder can award university degree credits to the successful graduates of Pmed.

The following specifications serve to set the standard of acceptance of the qualified educator (instructor).

1. Instructor Experience

The instructor must have the following experience:

- Instructor experience working in the occupational health and safety field;
- Instructor experience teaching occupational health and safety courses; and
- Instructor knowledge of the training and/or education field. Relevant degrees will include BEd, MEd, MA in Educational Technology, MA in Adult Education, PHDs in these fields and certificates in Adult Learning training programs.

2. Instructor Qualifications

The instructor must have the following qualifications:

- Instructor must have successfully completed graduate training from a recognized educational institute in the subject of occupational health and safety;
- Instructor must have formal education/training in adult education; and
- Instructor must have a minimum of 150 hours of providing satisfactory in-class instruction within two (2) years of the date of this request for proposal.

### 1.1.2 Point Rated Technical Criteria

#### i. Understanding of Scope and Objectives (40 points maximum)

In order to be effective, the bidder and DND must have a common understanding of the scope and objectives of the undertaking. To this end, bidders are to provide a narrative summary which reflects their understanding of the scope and objectives and which in turn establishes the basis for the bidder's proposal content. Simple reinstatement of the requirements does not indicate your understanding of the task nor the ability to carry it out.

#### ii. Corporate Experience (40 points maximum)

The bidder must have relevant corporate experience in similar types work. To demonstrate this experience, the bidder is to provide:

The details of two (2) requirements currently or previously managed by the bidder's firm, that demonstrates experience in providing classroom instruction in Occupational Health and Safety specific training within the scope of this requirement.

Details are to include:

Name and location of client for whom the work was done;

Length of time over which work was carried out;

Type of business / type of environment of the client for whom the work was done;

Type and extent (details) of the service provided.

### iii. Approach and Methodology (40 points maximum)

This section must outline the comprehensive approach to be followed in completing all aspects of the Statement of Work, including provision of qualified educator(s) to teach 63 days on the subjects of Occupational Health Legislation, occupational health equipment, occupational health inspections and occupational health surveys, and other activities identified in the Annex A Statement of Work.

a. In addition, a detailed work plan, outlining the methodology, specific activities planned, the timing and associated level of effort by 1) labour category or 2) individual, must be provided. Sufficient detail is to be provided to allow a complete understanding of how, when and by whom, the work is to be carried out.

b. In addition, a detailed timetable is to be provided covering activities from time of Contract award to Contract completion.

### iv. Qualification's of Key Personnel to be assigned to the Project (120 points maximum)

Considering the objective is to provide instruction in Occupational Health Legislation, occupational health equipment, occupational health inspections and occupational health surveys, it is imperative that bidders and the personnel they dedicate to this undertaking, have significant, current experience instruction in Occupational Health Legislation, occupational health equipment, occupational health inspections and occupational health surveys or other related fields, as indicated in Annex A Statement of Work and A-1 Specifications.

To demonstrate this experience and other personnel qualifications, bidders are to provide detailed résumés for each of the key personnel to be assigned to the project, stating the individual's education, work history and other relevant details, which clearly indicate that the extent of individual's qualifications to carry out the required work. As a minimum the qualifications of the personnel should include the following:

- a. Proof of education/training from a recognized educational institute in the subject of Occupational Health and Safety;
  - b. Number of hours of providing formal in-class instruction within two (2) years of the date of this Request For Proposal;
- c. A working knowledge of in-classroom adult learner evaluation;
- d. A working knowledge of adult education program design and evaluation; and
- e. Names and contact numbers of references who may verify facts provided in the sub-paras above should be provided if documents of evidence are not available.

In addition, as part of their proposal the Contractor shall produce a Personnel Replacement Plan specifying their backup personnel and confirm the ability of the replacement to respond immediately should the requirement occur.

**ANNEX D  
CALCULATION OF PRICE FOR EVALUATION PURPOSES ONLY**

**FIRM REQUIREMENT - Year 1**

**1. Lesson Plans**

The Contractor will be paid a firm lot price of \$ \_\_\_\_\_ for the preparation, submission and acceptance of the Lesson Plans.

**Total for Item 1 \$ \_\_\_\_\_**

**2. Labour Rates - Instructors (11 February 2013 to 10 May 2013)**

Bidders must submit firm rates for all categories of resources listed below.

Item	Category	Firm Per Diem Rate	# of Days	Extended Total
2.1	Instructor Based on one (1) instructor for sixty-three (63) working days	\$ _____	63	\$ _____

**Total for Item 2: \$ \_\_\_\_\_**

Definition of a Day/Proration

A day is defined as 7.5 hours exclusive of meal breaks. Payment will be for days actually worked with no provision for annual leave, statutory holidays and sick leave. Time worked which is more or less than a day will be prorated to reflect actual time worked in accordance with the following formula:

Hours worked: 7.5 x per diem rate

**3. Travel and Living Expenses**

The Contractor will be reimbursed its authorized travel and living expenses reasonably and properly incurred in the performance of the Work, at cost, without any allowance for profit and/or administrative overhead, in accordance with the meal, private vehicle and incidental expenses provided in Appendices B, C and D of the Treasury Board Travel Directive, and with the other provisions of the directive referring to "travellers", rather than those referring to "employees".

All travel must have the prior authorization of the Project Authority.

All payments are subject to government audit.

**Total Estimated Cost for Item 3: \$ \_\_\_\_\_**

**4. Other Expenses**

List any other expenses which may be applicable, giving an estimated cost for each.

\_\_\_\_\_

\_\_\_\_\_

**Total Estimated Cost for Item 4: \$ \_\_\_\_\_**

**The total price for the Firm Requirement (Year 1) will be the sum of the total cost for Item 1 + Item 2 + Item 3 + Item 4: \$ \_\_\_\_\_.**

**OPTIONAL REQUIREMENT - Year 2****1. Lesson Plans**

The Contractor will be paid a firm lot price of \$ \_\_\_\_\_ for the preparation, submission and acceptance of the Lesson Plans.

**Total for Item 1 \$ \_\_\_\_\_**

**2. Labour Rates - Instructors (3 February 2014 to 28 May 2014)**

Bidders must submit firm rates for all categories of resources listed below.

Item	Category	Firm Per Diem Rate	# of Days	Extended Total
2.1	Instructor Based on one (1) instructor for sixty-three (63) working days	\$ _____	63	\$ _____

**Total for Item 2: \$ \_\_\_\_\_**

Definition of a Day/Proration

A day is defined as 7.5 hours exclusive of meal breaks. Payment will be for days actually worked with no provision for annual leave, statutory holidays and sick leave. Time worked which is more or less than a day will be prorated to reflect actual time worked in accordance with the following formula:

Hours worked: 7.5 x per diem rate

**3. Travel and Living Expenses**

The Contractor will be reimbursed its authorized travel and living expenses reasonably and properly incurred in the performance of the Work, at cost, without any allowance for profit and/or administrative overhead, in accordance with the meal, private vehicle and incidental expenses provided in Appendices B, C and D of the Treasury Board Travel Directive, and with the other provisions of the directive referring to "travellers", rather than those referring to "employees".

All travel must have the prior authorization of the Project Authority.

All payments are subject to government audit.

**Total Estimated Cost for Item 3: \$ \_\_\_\_\_**

**4. Other Expenses**

List any other expenses which may be applicable, giving an estimated cost for each.

\_\_\_\_\_

\_\_\_\_\_

**Total Estimated Cost for Item 4: \$ \_\_\_\_\_**

The total price for the Optional Requirement (Year 2) will be the sum of the total cost for Item 1 + Item 2 + Item 3 + Item 4: \$ \_\_\_\_\_.

**OPTIONAL REQUIREMENT - Year 3****1. Lesson Plans**

The Contractor will be paid a firm lot price of \$ \_\_\_\_\_ for the preparation, submission and acceptance of the Lesson Plans.

**Total for Item 1 \$ \_\_\_\_\_**

**2. Labour Rates - Instructors (2 February 2015 to 27 May 2015)**

Bidders must submit firm rates for all categories of resources listed below.

Item	Category	Firm Per Diem Rate	# of Days	Extended Total
2.1	Instructor Based on one (1) instructor for sixty-three (63) working days	\$ _____	63	\$ _____

**Total for Item 2: \$ \_\_\_\_\_**

Definition of a Day/Proration

A day is defined as 7.5 hours exclusive of meal breaks. Payment will be for days actually worked with no provision for annual leave, statutory holidays and sick leave. Time worked which is more or less than a day will be prorated to reflect actual time worked in accordance with the following formula:

Hours worked: 7.5 x per diem rate

**3. Travel and Living Expenses**

The Contractor will be reimbursed its authorized travel and living expenses reasonably and properly incurred in the performance of the Work, at cost, without any allowance for profit and/or administrative overhead, in accordance with the meal, private vehicle and incidental expenses provided in Appendices B, C and D of the Treasury Board Travel Directive, and with the other provisions of the directive referring to "travellers", rather than those referring to "employees".

All travel must have the prior authorization of the Project Authority.

All payments are subject to government audit.

**Total Estimated Cost for Item 3: \$ \_\_\_\_\_**

**4. Other Expenses**

List any other expenses which may be applicable, giving an estimated cost for each.

\_\_\_\_\_  
\_\_\_\_\_

**Total Estimated Cost for Item 4: \$ \_\_\_\_\_**

**The total price for the Optional Requirement (Year 3) will be the sum of the total cost for Item 1 + Item 2 + Item 3 + Item 4.: \$ \_\_\_\_\_**

**ANNEX A  
STATEMENT OF WORK**

**1. TITLE**

**1.1 INDUSTRIAL / OCCUPATIONAL HYGIENE INSTRUCTION**

**2. BACKGROUND**

- 2.1 The Canadian Forces Health Services training Centre (CFHSTC) located in Canadian Forces Base (CFB) Borden, is responsible for the production of qualified Preventive Medicine (PMed) Technicians (Techs). PMed Techs must be able to competently and thoroughly inspect working and living areas in Canada and abroad, recognize and evaluate Occupational Health Hazards in the workplace and provide sound and efficient recommendations in controlling those occupational hazards. The PMed Tech must routinely be able to perform these duties as the sole expert, requiring little or no technical supervision while operating in full compliance with the applicable federal, provincial, territorial and/or national laws, regulations and standards.
- 2.2 CFHSTC has a requirement to contract the services of a qualified educator to teach 63 days on the subjects of Occupational Health Legislation, occupational health equipment, occupational health inspections and occupational health surveys to the students attending the PMed Qualification Level (QL) 6A course session 0005.

**3. OBJECTIVE**

- 3.1 The objective of this project is to conduct a PMed QL6A training session for approximately 9 to 12 students between 11 February 2013 and 10 May 2013 for a total of 63 training days. Upon completion of the contract, each student is to be able to appropriately recognize, evaluate and control health hazards in the workplace using a variety of legislative tools and analytical equipment. Furthermore, full university credits towards a recognized Occupational Health & Safety degree program will be attributed to successful students.

**4. DEFINITIONS**

- 4.1 Performance Objective (PO). A PO includes a description, in operational terms, of what the individual must do, the conditions under which the performance must be completed, and the standard to which the performance must conform. These three elements are respectively defined as performance statement, conditions and standard. A PO is divided into subcomponents called enabling objectives.
- 4.2 Enabling Objective (EO). An EO is a principal unit of learning and constitutes a major step towards achieving the PO. EOs may correspond to the major components identified in the first round of deconstructing POs, or they may result from grouping several related components. It is composed of three essential parts: a performance statement, conditions statement, and a standard.
- 4.3 Course Director. The Course Director is responsible for course administration and responsible for the conduct and administration of the PMed QL 6A course students. The Course Director also acts as liaison between the Contractor and CFHSTC.

- 4.4 Assistant Course Director. The PMed Program Petty Officer is responsible to assist the Course Director and to substitute for the Course Director as required.
- 4.5 IC PMed. The IC PMed is the Master Warrant Officer (IC) In Command of the PMed Program at CFHSTC. The Course Director reports to and takes direction from the IC PMed.

## **5. SCOPE**

- 5.1 This project spans the full range of conducting the 63-day course. The work requires the Contractor to convert the 13 EOs into a viable, logical schedule of progressive lessons, practices, activities, reviews and testing. The Contractor produces and delivers all instruction, supervises all practices, activities and reviews and testing.

## **6. TASKS**

- 6.1 The contractor is to conduct a 63-day PMed QL6A training course between 11 February 2013 and 10 May 2013. Specifically, the timetable, lesson plans, instruction and assessment for the following subjects:
  - 6.1.1 PO 001- Manage a Preventive Medicine Office consisting of EO 001.01 - Select Appropriate Occupational Health Legislation/Orders/Guidelines.
  - 6.1.2 PO 002 - Operate Occupational Health Equipment consisting of:
    - 6.1.2.1 EO 002.01 - Apply principles and theory of evaluating hazards in relation to occupational health equipment; and
    - 6.1.2.2 EO 002.02 - Utilize occupational health equipment.
  - 6.1.3 PO 003 - Conduct Occupational Health Inspections consisting of:
    - 6.1.3.1 EO 003.01 - Apply the principles and theories of industrial hygiene;
    - 6.1.3.2 EO 003.02 - Describe health hazards on the human body;
    - 6.1.3.3 EO 003.03 - Describe common industrial processes;
    - 6.1.3.4 EO 003.04 - Apply theories and principles of ventilation;
    - 6.1.3.5 EO 003.05 - Determine methods of controlling occupational exposures;
    - 6.1.3.6 EO 003.06 - Collect occupational health risk data; and
    - 6.1.3.7 EO 003.07 - Write an occupational health inspection report.
  - 6.1.4 PO 004 - Conduct occupational health surveys consisting of:
    - 6.1.4.1 EO 004.01 - Apply theories and principles of sampling;
    - 6.1.4.2 EO 004.02 - Perform an occupational health survey; and

6.1.4.3 EO 004.03 - Perform an Indoor Air Quality Survey.

- 6.2 Types, duration of lessons, method of instruction, etc for the academic content of the contract is defined by EOs, which are provided in full at Appendixes 1 to 13. The contractor must review each EO document and apply its dictates to the preparation and delivery of all lessons. If the contractor determines that any part of any EO is not in the best interests of the contract objective, the contractor will report the matter to the Course Director and reach an agreement before proceeding with the lesson.
- 6.3 The contractor will produce a timetable detailing the sequence of lessons and related activities for the entire 63-day contract period to include all lessons for all EOs to the Course Director as part of the bid for this contract. A suggested template is provided at Appendix 14.
- 6.4 **The contractor will prepare lesson plans that conform to the EOs and submit them to the Course Director in MS Word and/or MS PowerPoint not later than 01 February 2013.** The I/C PMed will review the plans and provide feedback or approval to the bidder. Templates for lesson plans are provided at Appendixes 15 and 16.
- 6.5 The contractor will develop and administer the confirmatory questions, practices, exercises tests and individual assignments necessary to supplement classroom teaching and to evaluate individual progress. The confirmatory technique to be used will be outlined in the applicable lesson plans.
- 6.6 Supplementary training aids provided by the contractor such as films, slide presentations and models must be approved by the Course Director prior to use and remain the property of the Contractor.
- 6.7 The contractor will conduct the classroom lessons, small group training sessions, reviews, assignment and test debriefs to teach the skills/knowledge outlined in the assigned lesson plans. This includes normal classroom, adult-learner supervision.
- 6.8 The contractor will provide weekly oral and/or written student assessment to Course Director throughout the period of the contract to cover the following points:
  - 6.8.1 Academic performance (knowledge and skills);
  - 6.8.2 Participation and involvement in the training;
  - 6.8.3 Self-directedness and teamwork;
  - 6.8.4 Motivation and initiative;
  - 6.8.5 Professional behavior (accountability, responsibility, patient confidentiality);
  - 6.8.6 Attitude (towards training, peers, staff);
  - 6.8.7 Communication skills/interpersonal skills (with clients, peers, staff); and
  - 6.8.8 Consideration of safety measures in training (client safety, universal precautions, body mechanics).

- 6.9 The contractor will contact the Course Director immediately when it is identified that a student is experiencing academic and/or disciplinary difficulties.
- 6.10 The contractor will schedule time for, provide copies of, invigilate and grade all exams.
- 6.11 The contractor will provide any supplemental learning aids required during the course of instruction.
- 6.12 The contractor will provide student files to include all completed tests, quizzes and other results to the Course Director by 23 May 2013.

## **7. DELIVERABLES**

- 7.1 The contractor will provide the following:
  - 7.1.1 Enabling Objective review to the Course Director as defined in paragraph 6.2;
    - 7.1.1 Enabling Objective review to the Course Director as defined in paragraph 6.2;
  - 7.1.2 Timetable as defined in paragraphs 6.1 and 6.3;
  - 7.1.3 Lesson plans as defined in paragraphs 6.1 and 6.4 in MS Word and/or MS PowerPoint to the Course Director by 01 February 2013;
  - 7.1.4 Confirmatory questions, practices, exercises, tests and individual assignments as defined in paragraphs 6.5 and 6.10;
  - 7.1.5 Instruction to the students between 11 February 2013 and 10 May 2013 in accordance with the 13 EOs and as defined in paragraphs 6.1 and 6.7 and Section 8;
  - 7.1.6 Exercise planning, supervision and safety as defined in paragraph 6.8;
  - 7.1.7 Weekly assessments as defined in paragraph 6.8;
  - 7.1.8 Student files by 23 May 2013 as defined in paragraph 6.12; and
  - 7.1.9 Transcripts and/or certificates for each student stating the university credits awarded to the individual in accordance with paragraph 2.2.

## **8. CONSTRAINTS**

- 8.1 Student Numbers. The number of students will be between 9 and 12.
- 8.2 Dates. The instructional portion of this conduct is to be delivered between 11 February 2013 and 10 May 2013 for a total of 63 training days.
- 8.3 Daily Routine. All student training associated with this contract will occur daily between 8:00 a.m. and 4:00 p.m., Monday through Friday.

- 8.4 Location. All student training associated with this contract will be delivered at CFHSTC, 30 Ortona Road, CFB Borden except for the two practical exercises which will be conducted on site at CFB Borden (workshop and building number to follow).
- 8.5 Language. Instruction and evaluation of the students will be in English.
- 8.6 Ownership of Intellectual Property. Ownership of intellectual property as it pertains to this Contract is specified in PWGSC Supplemental General Conditions 4006 (2010-08-16) Contractor to Own Intellectual property Rights in Foreground Information. As the training in question may result in the production of a completely new course package, the Department of National Defense reserves the right to use internally said product without restrictions. There are no restrictions on the Contractor using said materials for their business purposes.

## **9. CLIENT SUPPORT**

- 9.1 Training Materials. Other than the materials listed in paragraphs 6.6 and 6.10, CFHSTC can provide all required training materials, training aids, learning aids, equipment, and software. This includes but is not limited to Power Point projector, screen, TV, VCR, DVD, OHP, etc.
- 9.2 Classroom. Classroom space for student instruction will be provided by CFHSTC.
- 9.3 Exercise Location. CFHSTC will arrange for the sites for the practical exercises.
- 9.4 Equipment. CFHSTC will provide all occupational health equipment and analytical equipment required during this phase of training.
- 9.5 Office Support. If required by the proponent, CFHSTC is able to provide office support and space on site at CFB Borden.

*Appendixes, copies of which are attached hereto and forms part of any resultant Contract.*

- Appendix 1 - EO 001.01 - Select Appropriate Occupational Health Legislation/Orders/Guidelines
- Appendix 2 - EO 002.01 - Apply principles and theory of evaluating hazards in relation to Occupational Health equipment
- Appendix 3 - EO 002.02 - Utilize occupational health equipment
- Appendix 4 - EO 003.01 - Apply the principles and theories of industrial hygiene
- Appendix 5 - EO 003.02 - Describe health hazards on the human body
- Appendix 6 - EO 003.03 - Describe common industrial processes
- Appendix 7 - EO 003.04 - Apply theories and principles of ventilation
- Appendix 8 - EO 003.05 - Determine methods of controlling occupational exposures
- Appendix 9 - EO 003.06 - Collect occupational health risk data
- Appendix 10 - EO 003.07 - Write an occupational health inspection report
- Appendix 11 - EO 004.01 - Apply theories and principles of sampling
- Appendix 12 - EO 004.02 - Perform an occupational health survey
- Appendix 13 - EO 004.03 - Perform an Indoor Air Quality Survey
- Appendix 14 - Timetable Template
- Appendix 15 - Template for lesson plans
- Appendix 16 - Template for lesson plans

**EO 001.01**

1. **Performance:** Select Appropriate Occupational Health Legislation/Orders/Guidelines.

2. **Conditions:**

a. given:

- (1) references;
- (2) access to intranet (Defence Wide Area Network (DWAN));
- (3) case study; and
- (4) peer assistance; and

b. denied: supervision.

3. **Standard:** IAW specified references the PMed Tech QL6A student shall select appropriate occupational health legislation/orders/guidelines to support decisions/proposed solutions to problems.

4. **Teaching Points:**

a. discuss the six steps of project research to include (Ref: EO 001.01 Annex D):

- (1) highlight the subjects;
- (2) search for sources of information;
- (3) selection of documents;
- (4) preview the information;
- (5) select appropriate information; and
- (6) extract the information you want (required);

b. describe industrial hygiene and the law with specific attention to:

- (1) the industrial hygienist (Ref: C229E pg 180);
- (2) criteria of a professional (Ref: C229E pg 180);
- (3) ethical responsibilities (Ref: C229E pg 181);

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- (4) torts (Ref: C229E pg 181-182);
- (5) negligence (Ref: C229E pg 182-184); and
- (6) due diligence including (Ref: C449):
  - (a) definition;
  - (b) significance with industrial hygiene; and
  - (c) establishing a program;
- c. define the following:
  - (1) federal work, undertaking or business (Ref: C372E – Definitions para 3);
  - (2) dependant contractor (Ref: C372E – Definitions para 3);
  - (3) employee (Ref: C372E – Definitions para 3); and
  - (4) employer (Ref: C372E – Definitions para 3);
- d. describe the purpose of part to include preventive measures (Ref: C372E – article 122.2);
- e. describe the general duty of employer (Ref: C372E – article 124);
- f. describe provincial legislation (Ref: C450);
- g. describe the National Fire Protection Association (NFPA) code and standards (Ref: C451);
- h. describe the Canadian Standards Association (CSA) standards (Ref: C452);
- i. describe the health services facilities accreditation process with specific attention to (Ref: A291):
  - (1) Primary Care Renewal Initiatives (PCRI) and accreditation; and
  - (2) accreditation tips for the clinics; and
- j. describe the Professional Technical Network to include the integrating of the Professional Technical Network into the clinic model (Ref: A291).

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5. **Time:**

- a. 2 x 50 min pds – IL;
- b. 4 x 50 min pds – CS; and
- c. 1 x 50 min pd – debrief.

Total EO time = 350 min.

6. **Method of Instruction:**

- a. IL interactive lecture; and
- b. CS case study (pub-ex).

7. **Substantiation:**

- a. IL the interactive lecture method is used to present students with an oral presentation where they can participate by asking questions, commenting or responding to instructor questions; and
- b. CS the students respond to the description of a scenario related to the target performance, examining the facts and incidents of the case, to critically analyze them and develop solutions.

8. **References:**

- a. A291 Primary Care Renewal Initiative  
[http://hr.ottawa-hull.mil.ca/health/information/engraph/PCRI\\_home\\_e.asp?Lev1=2&Lev2=20&Lev3=1;](http://hr.ottawa-hull.mil.ca/health/information/engraph/PCRI_home_e.asp?Lev1=2&Lev2=20&Lev3=1;)
- b. C229E Patty's Industrial Hygiene & Toxicology: General Principles, 4th ed., Vol. 1, Part A. Editors: D. George & Florence E. Clayton. Publisher: John Wiley & Sons Inc. c1991;
- c. C372E Canada Labour Code, c1985  
[http://laws.justice.gc.ca/en/L-2/index.html;](http://laws.justice.gc.ca/en/L-2/index.html)
- d. C449 CCOHS – OSH Answers – Due Diligence  
<http://www.ccohs.ca/oshanswers/legisl/diligence.html?print;>

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- e. C450 Canadian Governments and Legislations – Library and Archives Canada  
<http://www.collectionscanada.ca/information-management/index-e.html>;
- f. C451 NPFA (National Fire Protection Association) – How the Code Process Works – Standard  
<http://www.nfpa.org/categoryList.asp?categoryID=162&URL=Codes%20and%20Standards/Code%20development%20process/How%20the%20code%20process%20works>; and
- g. C452 CSA (Canadian Standards Association) – Standards Development  
[www.csa.ca/standards/Default.asp?language=English](http://www.csa.ca/standards/Default.asp?language=English).

9. **Training Aids:**

- a. nil.

10. **Learning Aids:**

- a. case study (pub-ex);
- b. NPFA/CSA/ Canadian Centre for Occupational Health and Safety (CCOHS) handout (Annexes A, B, and C to EO 001.01); and
- c. the Research Conduct Method Documentary (Annex D to EO 001.01).

11. **Test Details:** the PMed Tech QL6A student shall select appropriate occupational health legislation/orders/guidelines through case study (pub-ex) based where the student will be assessed as **satisfactory/unsatisfactory**. Due to the critical nature of the material learned in this EO, the student’s knowledge will be verified and confirmed throughout the entire course in other homework and practical assignments.

12. **Remarks:**

- a. each student will receive their own case study (pub-ex) to conduct occupational health legislation/orders/guidelines exercise; and
- b. peer interaction is to be strongly encouraged during the completion of these tasks.

**EO 002.01**

1. **Performance:** Apply Principles and Theory of Evaluating Hazards in Relation to Occupational Health Equipment.
2. **Conditions:**
  - a. given: references; and
  - b. denied: assistance and/or supervision.
3. **Standard:** IAW specified references the PMed Tech QL6A student shall apply principles and theory of evaluating hazards in relation to occupational health equipment with specific attention to:
  - a. preparation of a sampling train;
  - b. calibration of occupational health equipment;
  - c. types of occupational health equipment; and
  - d. detection methods.
4. **Teaching Points:**
  - a. describe types of sampling to include (Ref: C197E, pg 485):
    - (1) personal vs area (Ref: C197E, pg 485-486); and
    - (2) grab vs integrated (Ref: C197E, pg 486);
  - b. describe a sampling train ((Ref: C197E, pg 486);
  - c. describe the use of collection devices for gases and vapours with specific attention to (Ref: C197E, pg 486):
    - (1) grab sampling (Ref: C197E, pg 486-487);
    - (2) integrated air sampling to include (Ref: C197E, pg 487):
      - (a) absorption (Ref: C197E, pg 487); and
      - (b) adsorption (Ref: C197E, pg 487-489); and
    - (3) passive monitors (Ref: C197E, pg 489);

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- d. describe collection devices for particulates to include (Ref: C197E, pg 489):
  - (1) filters (Ref: C197E, pg 489-490);
  - (2) cyclones (Ref: C197E, pg 490-492);
  - (3) electrostatic precipitators (Ref: C197E, pg 492);
  - (4) inertial impactors (Ref: C197E, pg 492);
  - (5) impinger (Ref: C197E, pg 492); and
  - (6) elutriator (Ref: C197E, pg 492);
- e. describe suction pumps (Ref: C197E, pg 492-493);
- f. describe flow rate meters to include (Ref: C197E, pg 493):
  - (1) pressure compensating devices (Ref: C197E, pg 493); and
  - (2) critical-flow orifices (Ref: C197E, pg 493-494);
- g. describe sampling method (Ref: C197E, pg 494-496);
- h. describe calibration of sampling equipment to include (Ref: C229E, pg 433-434 section 4.1):
  - (1) primary calibration using:
    - (a) mariotti bottle (Ref: C197E, pg 496);
    - (b) spirometer (Ref: C197E, pg 496); and
    - (c) soap bubble meter (Ref: C197E, pg 496-98); and
  - (2) secondary calibration using:
    - (a) wet test meter (Ref: C197E, pg 498);
    - (b) dry gas meter (Ref: C197E, pg 498); and
    - (c) precision rotameter (Ref: C197E, pg 499);
- i. discuss sampling and analytical error (Ref: C197E, pg 504);

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- j. describe record keeping (Ref: C197E, pg 504-506 and fig 16-27);
- k. describe the different reading instruments intended for one compound or group of compounds with specific attention to:
  - (1) combustible gas monitors to include (Ref: C197E, pg 510):
    - (a) explosive limits (Ref: C197E, pg 510);
    - (b) instrument design (Ref: C197E, pg 510-511);
    - (c) zero adjustment (Ref: C197E, pg 510-513);
    - (d) interpretation of meter readings (Ref: C197E, pg 513-514);
    - (e) high flash-point solvents (Ref: C197E, pg 514);
    - (f) catalyst poisoning (Ref: C197E, pg 514);
    - (g) interferences (Ref: C197E, pg 514); and
    - (h) other features (Ref: C197E, pg 514);
  - (2) oxygen monitors to include (Ref: C197E, pg 515):
    - (a) coulometric detectors (Ref: C197E, pg 515); and
    - (b) polarographic detectors (Ref: C197E, pg 515);
  - (3) carbon monoxide monitors (Ref: C197E, pg 515);
  - (4) indoor air quality monitors (Ref: C197E, pg 515-516);
  - (5) other monitors using electromechanical or metal oxide semiconductor detectors (Ref: C197E, pg 516);
  - (6) mercury vapour monitors (Ref: C197E, pg 517);
  - (7) direct-reading colorimetric tubes and badges to include (Ref: C197E, pg 517):
    - (a) detector tubes (Ref: C197E, pg 517);

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- (b) principles of operation (Ref: C197E, pg 517);
  - (c) active sampling (Ref: C197E, pg 517-518);
  - (d) flow rate (Ref: C197E, pg 518);
  - (e) passive monitors (Ref: C197E, pg 518-519);
  - (f) interpreting the results (Ref: C197E, pg 519);
  - (g) specificity (Ref: C197E, pg 519);
  - (h) shelf life (Ref: C197E, pg 519); and
  - (i) certification of chemical detector tube (Ref: C197E, pg 519-520);  
and
- (8) other colorimetric direct reading devices to include (Ref: C197E, pg 520):
- (a) colorimetric tape samplers (Ref: C197E, pg 520); and
  - (b) colorimetric analyzer (Ref: C197E, pg 520);
1. discuss monitors intended for a broad range of compounds to include:
- (1) non-specific detectors to include (Ref: C197E, pg 520):
    - (a) flame ionization detectors (FID) (Ref: C197E, pg 520-521);
    - (b) photo ionization detector (PID) (Ref: C197E, pg 521-522);
    - (c) electron capture detectors (Ref: C197E, pg 522); and
    - (d) thermal conductivity detectors (Ref: C197E, pg 522);
  - (2) spectrophotometers and spectrometers to include (Ref: C197E, pg 522):
    - (a) infrared analyzers (IR) (Ref: C197E, pg 522-523);
    - (b) photo acoustic spectrometers (Ref: C197E, pg 523); and
    - (c) ultraviolet analyser (Ref: C197E, pg 523);
  - (3) gas chromatographs (Ref: C197E, pg 523-24);

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- (4) ion mobility spectrometer (Ref: C197E, pg 524); and
- (5) particulates monitor (Ref: C197E, pg 525-526); and
- m. discuss calibration (Ref: C197E, pg 526).

5. **Time:**

- a. 8 x 50 min pds – IL/D; and
- b. 2 x 50 min pds – EC.

Total EO time = 400 min; and

Total EC time = 100 min.

6. **Method of Instruction:**

- a. IL interactive lecture; and
- b. D demonstration.

7. **Substantiation:**

- a. IL the interactive lecture method is used to present the students with an oral presentation where they can participate by asking questions, commenting or responding to instructor questions; and
- b. D the demonstration method is used to provide the student with a correct and detailed example of the procedure.

8. **References:**

- a. C197E Fundamentals of Industrial Hygiene: occupation safety and health series, 4<sup>th</sup> Edition National Safety Council, Itasca, Ill. c1996; and
- b. C229E Patty's Industrial Hygiene and Toxicology: general principles, 4<sup>th</sup> Edition, Volume 1, Part A, Publisher: John Wiley & Sons Inc. C1991.

9. **Training Aids:**

- a. sampling trains; and
- b. over head (OH) equipment.

**EO 002.01**

10. **Learning Aids:**

a. nil.

11. **Test Details:** the PMed Tech QL6A student shall apply principles and theory of evaluating hazards in relation to occupational health equipment through a written EC where the student must achieve a minimum of 70% for a satisfactory result. Due to the critical nature of the material learned in this EO, the PMed Tech QL6A student's knowledge will be verified and confirmed throughout the entire course in other homework and practical assignments.

12. **Remarks:** nil.

**EO 002.02**

1. **Performance:** Utilize Occupational Health Equipment.
2. **Conditions:**
  - a. given:
    - (1) references;
    - (2) equipment; and
    - (3) peer assistance; and
  - b. denied: instructor supervision.
3. **Standard:** IAW the specified references the PMed Tech QL6A student shall operate occupational health equipment by:
  - a. describing with precision the occupational health equipment and accessories;
  - b. performing first line maintenance on occupational health equipment; and
  - c. performing calibration on occupational health equipment.
4. **Teaching Points:**
  - a. operate the VelociCalc® Plus Air Velocity Meter through the demonstration of main functions, and performance of first line maintenance and calibration with specific attention to:
    - (1) unpacking and parts identification (Ref: A6(1), pg 1-2);
    - (2) setting-up (Ref: A6(1), pg 3-5);
    - (3) operation (Ref: A6(1), pg 7-16);
    - (4) maintenance (Ref: A6(1), pg 17);
    - (5) troubleshooting (Ref: A6(1), pg 19);
    - (6) specifications (Ref: A6(1), pg 21); and
    - (7) gip switch settings (Ref: A6(1), pg 25);

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- b. operate the Q-Trak™ Indoor Air Quality (IAQ) Monitor through the demonstration of main functions, and performance of first line maintenance and calibration with specific attention to:
  - (1) unpacking and parts identification (Ref: A6(2), pg 1-2);
  - (2) setting-up (Ref: A6(2), pg 3-6);
  - (3) operation (Ref: A6(2), pg 7-20);
  - (4) calibration and maintenance (Ref: A6(2), pg 21-27);
  - (5) troubleshooting (Ref: A6(2), pg 29);
  - (6) specifications (Ref: A6(2), pg 31); and
  - (7) internal dip switch settings (Ref: A6(2), pg 35);
  
- c. operate the DustTrak™ Aerosol Monitor through the demonstration of main functions, and performance of first line maintenance and calibration with specific attention to:
  - (1) unpacking and parts identification (Ref: A6(3), pg 1-2);
  - (2) setting-up (Ref: A6(3), pg 5-8);
  - (3) operation (Ref: A6(3), pg 9-28);
  - (4) maintenance (Ref: A6(3), pg 29-36);
  - (5) troubleshooting (Ref: A6(3), pg 37);
  - (6) specifications (Ref: A6(3), pg 39);
  - (7) DustTrak model 8520-1 environmental enclosure operation and maintenance manual (Ref: A6(3), pg 41-42);
  - (8) setting-up (Ref: A6(3), pg 44-52);
  - (9) maintenance (Ref: A6(3), pg 57-58);
  - (10) troubleshooting the environmental enclosure (Ref: A6(3), pg 59); and
  - (11) specifications: environmental enclosure (Ref: A6(3), pg 61);

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- d. operate the MultiRAE PLUS Multi Gas Monitor through the demonstration of main functions, and performance of first line maintenance and calibration with specific attention to:
  - (1) operation of MultiRAE PLUS (Ref: A6(4), pg 2-1 – 2-24);
  - (2) operation of accessories (Ref: A6(4), pg 3-1 – 3-8);
  - (3) programming of MultiRAE PLUS to include:
    - (a) programming mode (Ref: A6(4), pg 4-2 – 4-3);
    - (b) keys for programming mode (Ref: A6(4), pg 4-4);
    - (c) entering into programming menu (Ref: A6(4), pg 4-5 – 4-6);
    - (d) calibration of MultiRae Plus Monitor (Ref: A6(4), pg 4-7 – 4-18);
    - (e) change alarm limits (Ref: A6(4), pg 4-19 – 4-20);
    - (f) view or change datalog (Ref: A6(4), pg 4-21 – 4-27);
    - (g) change monitor setup (Ref: A6(4), pg 4-28 – 4-36); and
    - (h) change sensor configuration (Ref: A6(4), pg 4-37 – 4-45);
  - (4) computer interface for MultiRAE Plus (Ref: A6(4), pg 5-1 – 5-39);
  - (5) theory of operation (Ref: A6(4), pg 6-1);
  - (6) maintenance (Ref: A6(4), pg 7-1 – 7-11); and
  - (7) troubleshooting (Ref: A6(4), pg 8-1 – 8-11);
  
- e. operate the GilAir-5 Tri-Mode Air Sampler through the demonstration of main functions, and performance of first line maintenance and calibration with specific attention to:
  - (1) general description (Ref: A6(5), pg 5-10);
  - (2) operation to include (Ref: A6(5), pg 11-18):
    - (a) high flow operation;

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- (b) sampling with clock version;
  - (c) sampling with programmable version;
  - (d) low flow operation;
  - (e) bag sampling, constant flow; and
  - (f) bag sampling – multi-flow;
- (3) maintenance (Ref: A6(5), pg 19-29); and
  - (4) pump specifications (Ref: A6(5), pg 30-31);
- f. operate the Gilibrator™ through the demonstration of main functions, and performance of first line maintenance and calibration with specific attention to:
- (1) general description (Ref: A6(6), pg 2-6);
  - (2) theory of operation (Ref: A6(6), pg 7);
  - (3) operating procedures – initial set-up and operation (Ref: A6(6), pg 8-12);
  - (4) storage and maintenance (Ref: A6(6), pg 13-17);
  - (5) the printer module to include (Ref: A6(6), pg 18):
    - (a) introduction and general description (Ref: A6(6), pg 18-19);
    - (b) theory of operation (Ref: A6(6), pg 19);
    - (c) operation procedures (Ref: A6(6), pg 19-21); and
    - (d) storage and maintenance (Ref: A6(6), pg 21);
  - (6) specifications (Ref: A6(6), pg 22-23); and
  - (7) gilibrator parts list (Ref: A6(6), pg 23);

**EO 002.02**

- g. operate the Gilian® Battery Maintenance System (BMS) II through the demonstration of main functions, and performance of first line maintenance and calibration with specific attention to:
  - (1) introduction to include:
    - (a) overview (Ref: A6(7), pg 8);
    - (b) features (Ref: A6(7), pg 8); and
    - (c) plugs and adapters (Ref: A6(7), pg 10);
  - (2) operation modes to include:
    - (a) automatic charge mode (Ref: A6(7), pg 12); and
    - (b) capacity evaluate mode (Ref: A6(7), pg 12);
  - (3) operation to include:
    - (a) setting up (Ref: A6(7), pg 16); and
    - (b) program selection (Ref: A6(7), pg 16);
  - (4) parts list (Ref: A6(7), pg 17);
  - (5) specifications (Ref: A6(7), pg 18);
  - (6) returned material authorization (Ref: A6(7), pg 20);
  - (7) care sheet for maximizing Nickel-Cadmium (Ni-Cad) and Nickel Metal Hydride(NiMhH) battery performance (Ref: A6(8)); and
  - (8) NiCd, NiMH & Lithium Ion (Li-ion) Comparison chart (Ref: A6(8));
- h. operate the SidePak™ Personal Aerosol Monitor through the demonstration of main functions, and performance of first line maintenance and calibration with specific attention to:
  - (1) unpacking and parts identification (Ref: A6(9), pg 1-2);
  - (2) setting-up (Ref: A6(9), pg 7-16);

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- (3) operation to include (Ref: A6(9), pg 17):
  - (a) keypad functions (Ref: A6(9), pg 17);
  - (b) identifying SidePak AM510 features (Ref: A6(9), pg 18);
  - (c) power up (Ref: A6(9), pg 18);
  - (d) power down (Ref: A6(9), pg 19);
  - (e) survey mode (Ref: A6(9), pg 19); and
  - (f) main menu to include (Ref: A6(9), pg 19):
    - i. data log (Ref: A6(9), pg 20);
    - ii. setup menu (Ref: A6(9), pg 27);
    - iii. statistics (Ref: A6(9), pg 34); and
    - iv. zero cal (Ref: A6(9), pg 35);
- (4) maintenance (Ref: A6(9), pg 37-44);
- (5) troubleshooting (Ref: A6(9), pg 45-48);
- (6) specifications (Ref: A6(9), pg 49-52);
- (7) custom calibrations (Ref: A6(10), pg 53-54);
- (8) converting stored data to calibrated data (Ref: A6(9), pg 55); and
- (9) quick reference (Ref: A6(9), pg 57);
- i. operate the Biotest HYCON Air Sampler through the demonstration of main functions, and performance of first line maintenance and calibration with specific attention to:
  - (1) individual parts and functions (Ref: A6(10), pg 3, 27);
  - (2) application (Ref: A6(10), pg 15);

**EO 002.02**

- (3) principles of operation and construction (Ref: A6(10), pg 16);
- (4) operation to include (Ref: A6(10), pg 17-19):
  - (a) general notes on operation;
  - (b) sterilization and decontamination before use;
  - (c) insertion of the Agar Strip;
  - (d) switching the instrument on;
  - (e) setting the sample volume;
  - (f) starting the instrument;
  - (g) switching the instrument off; and
  - (h) removal of the Agar Strip;
- (5) evaluation of the results (Ref: A6(10), pg 19);
- (6) display messages/acoustic signals (Ref: A6(10), pg 20);
- (7) service and maintenance to include (Ref: A6(10), pg 20-21):
  - (a) general RESET; and
  - (b) calibration;
- (8) accessories (Ref: A6(10), pg 22);
- (9) technical data (Ref: A6(10), pg 23); and
- (10) special notes for the explosion Proof version RCS Plus EX (Ref: A6(10), pg 24);

**EO 002.02**

- j. operate the Anderson ambient particle sizing sampler through the demonstration of main functions, and performance of first line maintenance and calibration with specific attention to:
  - (1) one stage viable particle sampler to include:
    - (a) fungi (Ref: A6(11), pg 2);
    - (b) bacteria (Ref: A6(11), pg 3); and
    - (c) thermophilic actinomycetes (Ref: A6(11), pg 3);
  - (2) aerodynamic particle sizing (Ref: A6(11), pg 4);
  - (3) compactors to include:
    - (a) description (Ref: A6(11), pg 5);
    - (b) assembly (Ref: A6(11), pg 5-6);
    - (c) sampling (Ref: A6(11), pg 6); and
    - (d) calibration (Ref: A6(11), pg 6-7);
  - (4) analysis and interpretation (Ref: A6(11), pg 7-8); and
  - (5) instruction for vacuum pump (Ref: A6(11), pg 8-10, 12);
  
- k. operate the Alnor® Velometer® series 6000 through the demonstration of main functions, and performance of first line maintenance and calibration with specific attention to:
  - (1) description (Ref: A6(12), pg 1);
  - (2) preparation for use (Ref: A6(12), pg 8);
  - (3) operation (Ref: A6(12), pg 14);
  - (4) list of models and accessories (Ref: A6(12), pg 20);
  - (5) maintenance (Ref: A6(12), pg 21);
  - (6) trouble shooting guide (Ref: A6(12), pg 23);

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- (7) temperature/pressure corrections (Ref: A6(12), pg 24); and
- (8) specifications (Ref: A6(12), pg 25); and

l. operate the AccuBALANCE® Plus Air Capture Hood through the demonstration of main functions, and performance of first line maintenance and calibration with specific attention to:

- (1) set up (Ref: A6(13), pg 1-12);
- (2) operations in more detail (Ref: A6(13), pg 13-34);
- (3) maintenance (Ref: A6(13), pg 35-36);
- (4) troubleshooting (Ref: A6(13), pg 37);
- (5) back pressure (Ref: A6(13), pg 41); and
- (6) specifications (Ref: A6(13), pg 43).

5. **Time:**

- a. 12 x 50 min pds – self study in syndicates (presentation and handout preparation);
- b. 14 x 50 min pds – presentation of equipment by the students; and
- c. 17 x 50 min pds – practical application for using equipment.

Total EO time = 2150 min.

6. **Method of Instruction:**

- a. syndicate study work and presentation with demonstration.

7. **Substantiation:**

- a. the students work in groups and receive instructional materials from the instructors. They use the material to present and demonstrate to the class.

**EO 002.02**

8. **References:**

- a. (Ref: A6 Manufacturer's Instructions for:
- (1) VelociCalc® Plus Air Velocity Meter operation manual (held in PMed Lab);
  - (2) QTrak™ IAQ Monitor operation manual (held in PMed Lab);
  - (3) DustTrak™ Aerosol Monitor operation manual (held in PMed Lab);
  - (4) MultiRAE PLUS Multi Gas Monitor PGM-50 operation manual (held in PMed Lab);
  - (5) GilAir-5 Tri-Mode Air Sampler operation manual (held in PMed Lab);
  - (6) The Gilibrator™ operation manual (held in PMed Lab);
  - (7) Gilian® BMS II operation manual (held in PMed Lab);
  - (8) Galaxy Battery handout (held in PMed Lab);
  - (9) SidePak™ Personal Aerosol Monitor user guide (held in PMed Lab);
  - (10) Biotest HYCON Air Sampler, operating manual (held in PMed Lab);
  - (11) Anderson ambient particle sizing sampler, operating manual (held in PMed Lab);
  - (12) Alnor® Velometer® series 6000, owner's manual (held in PMed Lab); and
  - (13) AccuBALANCE® Plus Air Capture Hood, operation and service manual (held in PMed Lab).

9. **Training Aids:**

- a. nil.

**EO 002.02**

10. **Learning Aids:**

- a. handout provided by the syndicate.

11. **Test Details:**

- a. the PMed Tech QL6A student shall operate occupational health equipment where the student, in syndicates, will learn the equipment and then demonstrate it and conduct presentations. The PMed Tech QL6A student's presentation will be assessed as **satisfactory/unsatisfactory** as per checklist. Due to the critical nature of the material learned in this EO, the PMed Tech QL6A student's knowledge will be verified and confirmed throughout the entire course in other homework, tests and practical assignments; and
- b. there will be no formal PC for PO 002; operation of equipment will be tested in PC 004.

12. **Remarks:**

- a. an instructor does not teach this EO but will be present to assist the students as needed;
- b. student presentations should be carried out in the PMed Lab as a practical demonstration; and
- c. instructor to provide an example of a handout to ensure continuity (Annex B to EO 002.02).

**EO 003.01**

1. **Performance:** Apply the Principles and Theories of Industrial Hygiene.
2. **Conditions:**
  - a. given: references; and
  - b. denied: assistance and/or supervision.
3. **Standard:** IAW specified references the PMed Tech QL6A student will apply the principles and theories of industrial hygiene by:
  - a. applying a methodology that employs critical thought processes from theory to practical application; and
  - b. demonstrating scientific and mathematical problem solving techniques for industrial health work place situations.
4. **Teaching Points:**
  - a. explain the basic concepts of occupational health with specific attention to:
    - (1) the definition of industrial hygiene (Ref: C197E, pg 3 para 1);
    - (2) the definition industrial hygienist (Ref: C197E, pg 3 para 2);
    - (3) professional ethics (Ref: C197E, pg 4); and
    - (4) the components of the occupational health and safety team (Ref: C197E, pg 4-5);
  - b. explain the definitions of environmental factors or stresses to include:
    - (1) chemical hazards (Ref: C197E, pg 7);
    - (2) physical hazards (Ref: C197E, pg 7);
    - (3) biological hazards (Ref: C197E, pg 7); and
    - (4) ergonomic stresses (Ref: C197E, pg 7);
  - c. explain the general principles of evaluation with specific attention to:
    - (1) the basic approach to hazard recognition (Ref: C197E, pg 454);

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- (2) review of literature (Ref: C197E, pg 454);
  - (3) inventory (Ref: C197E, pg 455);
  - (4) the process or operation (Ref: C197E, pg 455-456);
  - (5) the process flow sheet (Ref: C197E, pg 456);
  - (6) checklists (Ref: C197E, pg 458-459);
  - (7) cleaning methods (Ref: C197E, pg 459);
  - (8) the process of safety management (Ref: C197E, pg 459); and
  - (9) field survey to include (Ref: C197E, pg 460-461):
    - (a) sensory perception;
    - (b) control measures in use; and
    - (c) observation and interview;
- d. explain the basics principles, concepts and theories of chemistry with specific attention to:
- (1) composition of matter (Ref: C180E, pg 34-40);
  - (2) structure of matter to include (Ref: C180E, pg 42-57):
    - (a) atoms;
    - (b) Dalton's Atomic Theory;
    - (c) inside the atom;
    - (d) atomic number;
    - (e) atomic mass;
    - (f) mass number;
    - (g) number of neutrons;
    - (h) isotopes;

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- (i) structure of the Atom;
- (j) arrangement of electrons;
- (k) energy sublevels;
- (l) periodic table; and
- (m) metals, nonmetals, metalloids; and
- (3) chemical bondings to include:
  - (a) molecules (Ref: C180E, pg 62);
  - (b) symbols and formulas (Ref: C180E, pg 62-63);
  - (c) formation of ions (Ref: C180E, pg 63-65);
  - (d) ionic bonds (Ref: C180E, pg 66);
  - (e) covalent bonds (Ref: C180E, pg 71-72); and
  - (f) molecular mass (Ref: C180E, pg 80-83);
- e. explain the state of matter (Ref: C180E, pg 28);
- f. explain gas laws with specific attention to:
  - (1) ideal gas law (Ref: C174E, pg 42 section 6);
  - (2) gas volume correction to include:
    - (a) Charles' law (Ref: C174E, pg 39 section 5); and
    - (b) Boyles' law (Ref: C174E, pg 38);
  - (3) Dalton's law (Ref: C174E, pg 45 section 8); and
  - (4) gram molecular volume (Ref: C174E, pg 43 section 7);
- g. explain concentration calculation to include (Ref: C174E, pg 86-87):
  - (1) conversion calculation (Ref: C174E, pg 82 section 6 para 1);

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- h. explain organic chemistry with specific attention to:
  - (1) importance of organic chemistry (Ref: C180E, pg 239);
  - (2) structural formulas (Ref: C180E, pg 240-243);
  - (3) isomers (Ref: C180E, pg 243); and
  - (4) bonding ability of carbon (Ref: C180E, pg 243-244);
  
- i. explain hydrocarbons through definitions with specific attention to:
  - (1) alkanes (Ref: C180E, pg 248-257);
  - (2) alkyl groups (Ref: C180E, pg 252-257);
  - (3) cycloalkanes (Ref: C180E, pg 257-258);
  - (4) sources of hydrocarbons (Ref: C180E, pg 258-259); and
  - (5) properties of hydrocarbons (Ref: C180E, pg 259-262);
  
- j. explain alcohols and ethers with specific attention to (Ref: C180E, pg 282-294):
  - (1) alcohols;
  - (2) writing structures;
  - (3) methyl;
  - (4) ethyl;
  - (5) ethylene glycol;
  - (6) glycerol;
  - (7) other;
  - (8) types;
  - (9) reactions;
  - (10) thiols;

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- (11) phenols;
- (12) phenol derivatives; and
- (13) ethers; and
- k. explain all other organic compounds with specific attention to:
  - (1) aldehydes (Ref: C180E , pg 297-302);
  - (2) ketones (Ref: C180E , pg 302-305);
  - (3) organic acids (Ref: C180E , pg 305-310);
  - (4) esters (Ref: C180E , pg 313-317);
  - (5) aliphatic amines (Ref: C180E , pg 317-321);
  - (6) amino acids (Ref: C180E , pg 321-323);
  - (7) amides (Ref: C180E, pg 323-325); and
  - (8) aromatic compounds to include (Ref: C180E, pg 273-279):
    - (a) benzenes;
    - (b) toluene;
    - (c) xylene;
    - (d) naphthalene; and
    - (e) anthracene and phenanthrene.

5. **Time:**

- a. 28 x 50 min pds – IL; and
- b. 2 x 50 min pds – EC.

Total EO time = 1400 min; and

Total EO time = 100 min.

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6. **Method of Instruction:**

- a. IL interactive lecture.

7. **Substantiation:**

- a. IL the interactive lecture method is used to present students with an oral presentation where they can participate by asking questions, commenting or responding to instructor questions.

8. **References:**

- a. C174E Calculation methods for industrial hygiene, Salvatore R. Dinardi; Van Nostrand Reinhold Publishing. c1995;
- b. C180E Chemistry for the Health Sciences, 8<sup>th</sup> edition, George I. Sackheim & Dennis D. Lehman: Toronto, Prentice Hall. c1998; and
- c. C197E Fundamental of Industrial Hygiene: occupation safety and health series. 4th ed. National Safety Council, Itasca, Ill. c1996.

9. **Training Aids:**

- a. nil.

10. **Learning Aids:**

- a. student handout with practice problems.

11. **Test Details:** the PMed Tech QL6A student shall apply the principles and theories of industrial hygiene through a minimum of two homework assignments. Due to the critical nature of the material learned in this EO, the PMed Tech QL6A student's knowledge will be verified and confirmed throughout the entire course in other homework and practical assignments.

12. **Remarks:** due to the critical nature of this knowledge, practical application will be verified in both PC 003 and PC 004.

**EO 003.02**

1. **Performance:** Describe Health Hazards on the Human Body.
2. **Conditions:**
  - a. given: references; and
  - b. denied: assistance and/or supervision.
3. **Standard:** IAW specified references the PMed Tech QL6A student will describe health hazards on the human body to include:
  - a. human anatomy and physiology;
  - b. the effects of microorganisms;
  - c. the effects of toxic substances; and
  - d. the effects of radiation.
4. **Teaching Points:**
  - a. describe the respiratory system with specific attention to:
    - (1) gas exchange (Ref: C197E, pg 42 paras 1-4);
    - (2) oxygen tension (Ref: C197E, pg 42-43 paras 1-3);
    - (3) pressure changes (Ref: C197E, pg 43-44 paras 1, 2 and 4);
    - (4) hazards (Ref: C197E, pg 47-48 para 1, para 2 bullet 6 and para 12); and
    - (5) natural defences (Ref: C197E, pg 48-79 paras 1 and 2);
  - b. describe the skin with specific attention to (Ref: C197E, pg 53 para 1):
    - (1) anatomy and physiology to include:
      - (a) blood vessels (Ref: C197E, pg 56);
      - (b) hair (Ref: C197E, pg 56);
      - (c) ultra violet light (Ref: C197E, pg 57); and
      - (d) skin absorption (Ref: C197E, pg 57 para 2);

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- (2) defence mechanism (Ref: C197E, pg 58); and
- (3) direct causes of occupational skin disease to include (Ref: C197E, pg 59 para 1):
  - (a) chemical (Ref: C197E, pg 59 para 1);
  - (b) mechanical (Ref: C197E, pg 63);
  - (c) physical (Ref: C197E, pg 63);
  - (d) biological (Ref: C197E, pg 64); and
  - (e) botanical (Ref: C197E, pg 64);
- c. describe the eyes with specific attention to (Ref: C197E, pg 103 para 1 and 1):
  - (1) physical hazards (Ref: C197E, pg 110);
  - (2) irradiation burns to include:
    - (a) damage mechanisms (Ref: C197E, pg 112);
    - (b) ultraviolet radiation (Ref: C197E, pg 112); and
    - (c) infrared radiation (Ref: C197E, pg 112); and
  - (3) chemical hazards (Ref: C197E, pg 112);
- d. describe industrial toxicology (Ref: C197E, pg 123 para 1) with specific attention to:
  - (1) definition (Ref: C197E, pg 123-124);
  - (2) toxicity versus hazards (Ref: C197E, pg 124);
  - (3) entry into the body (Ref: C197E, pg 125) to include:
    - (a) inhalation (Ref: C197E, pg 125);
    - (b) skin absorption (Ref: C197E, pg 125);

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- (c) ingestion (Ref: C197E, pg 125-126); and
- (d) injection (Ref: C197E, pg 126 paras 1 and 2);
- (4) dose-response relationship (Ref: C197E, pg 126 para 1);
- (5) threshold concept (Ref: C197E, pg 126-127);
- (6) lethal dose (Ref: C197E, pg 127);
- (7) lethal concentration (Ref: C197E, pg 127-128);
- (8) responses (Ref: C197E, pg 128);
- (9) action of toxic substances to include (Ref: C197E, pg 128):
  - (a) acute effects (Ref: C197E, pg 129);
  - (b) chronic effects (Ref: C197E, pg 129); and
  - (c) exposures (Ref: C197E, pg 129);
- (10) effects of exposure to air contaminants to include (Ref: C197E, pg 129):
  - (a) irritation (Ref: C197E, pg 129-130); and
  - (b) asphyxiants to include (Ref: C197E, pg 131):
    - i. chemical asphyxiants (Ref: C197E, pg 131);
- (11) central nervous system depressants (Ref: C197E, pg 132);
- (12) other effects to include (Ref: C197E, pg 132):
  - (a) cardiac sensitization (Ref: C197E, pg 132); and
  - (b) neurotoxic effects (Ref: C197E, pg 132-134);
- (13) neoplasms and reproductive toxicity to include (Ref: C197E, pg 134):
  - (a) carcinogenesis (Ref: C197E, pg 134-135);

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- (b) mutagensis (Ref: C197E, pg 135-136); and
- (c) reproductive toxicity (Ref: C197E, pg 136);
- (14) American Conference of Industrial Hygienists (ACGIH) threshold limit values to include (Ref: C197E, pg 140):
  - (a) guides (Ref: C197E, pg 140-141);
  - (b) TWA (Ref: C197E, pg 141);
  - (c) ceiling values (Ref: C197E, pg 141);
  - (d) mixtures (Ref: C197E, pg 142);
  - (e) carcinogens (Ref: C197E, pg 142);
  - (f) physical factors (Ref: C197E, pg 142);
  - (g) unlisted substances (Ref: C197E, pg 142-143);
  - (h) basic data used for threshold Limit Values (TLV) (Ref: C197E, pg 143); and
  - (i) documentation (Ref: C197E, pg 143); and
- (15) biological standards to include (Ref: C197E, pg 143-145):
  - (a) urine tests (Ref: C197E, pg 145);
  - (b) blood analysis (Ref: C197E, pg 145);
  - (c) breath analysis (Ref: C197E, pg 145-146); and
  - (d) biological limits (Ref: C197E, pg 146);
- e. describe gases, vapours and solvents with specific attention to (Ref: C197E, pg 153):
  - (1) critical exposure factors to include:
    - (a) mode of use and potential for exposure (Ref: C197E, pg 154);
    - (b) temperature and volatility (Ref: C197E, pg 154);

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- (c) concentration (Ref: C197E, pg 154);
- (d) reality (Ref: C197E, pg 154); and
- (e) exposure guidelines (Ref: C197E, pg 154);
- (2) solvents to include (Ref: C197E, pg 155):
  - (a) aqueous systems (Ref: C197E, pg 155); and
  - (b) organic systems (Ref: C197E, pg 155);
- (3) gases to include (Ref: C197E, pg 159):
  - (a) cryogenics (Ref: C197E, pg 159);
  - (b) simple asphyxiants (Ref: C197E, pg 159-160); and
  - (c) chemical asphyxiants (Ref: C197E, pg 160);
- (4) flammable and combustible liquids to include (Ref: C197E, pg 160):
  - (a) flammable liquids (Ref: C197E, pg 160);
  - (b) combustible (Ref: C197E, pg 160);
  - (c) flashpoint (Ref: C197E, pg 160-161); and
  - (d) flammable range (Ref: C197E, pg 161);
- (5) effects to include:
  - (a) physiological effects to include (Ref: C197E, pg 161):
    - (i) aqueous systems (Ref: C197E, pg 161);
    - (ii) organic compounds (Ref: C197E, pg 161);
    - (iii) aliphatic hydrocarbons (Ref: C197E, pg 162);
    - (iv) cyclic hydrocarbons (Ref: C197E, pg 162);
    - (v) aromatic hydrocarbons (Ref: C197E, pg 162);

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- (vi) halogenated hydrocarbons (Ref: C197E, pg 162-163);
- (vii) nitrohydrocarbons (Ref: C197E, pg 163);
- (viii) oxygen-containing functional groups (Ref: C197E, pg 163-165);
- (ix) inorganic acids (Ref: C197E, pg 165); and
- (x) organic and inorganic gases (Ref: C197E, pg 165); and
- (b) hazard potential to include (Ref: C197E, pg 165):
  - (i) other factors (Ref: C197E, pg 165-166);
- (6) evaluation of hazards (Ref: C197E, pg 167); and
- (7) control of hazards to include;
  - (a) responsibility of health and safety personnel (Ref: C197E, pg 168);
  - (b) process controls (Ref: C197E, pg 168-169);
  - (c) engineering controls (Ref: C197E, pg 169-170); and
  - (d) Personal Protective Equipment (PPE) (Ref: C197E, pg 170-172);
- f. describe particulates with specific attention to (Ref: C197E, pg 175-177):
  - (1) definitions to include:
    - (a) dust (Ref: B18E, pg 244);
    - (b) fumes (Ref: B18E, pg 244);
    - (c) mists (Ref: B18E, pg 244, 246);
    - (d) fog (Ref: B18E, pg 246);
    - (e) smoke (Ref: B18E, pg 246);
    - (f) fibre (Ref: B18E, pg 246);

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- (g) gases (Ref: C197E, pg 952);
  - (h) vapours (Ref: C197E, pg 982);
  - (i) brownian motion (Ref: C197E, pg 937);
  - (j) impingement (Ref: C197E, pg 956);
  - (k) flocculation (Ref: C197E, pg 950);
  - (l) inertial movement (Ref: C197E, pg 956);
  - (m) entrainment velocity (Ref: C197E, pg 947);
  - (n) convection (Ref: C197E, pg 942);
  - (o) centrifugal motion (Ref: B257);
  - (p) electrical movement (Ref: B257);
  - (q) thermal movement (Ref: B257);
  - (r) air movement (Ref: B257);
  - (s) mechanical causes (Ref: B257);
  - (t) induction (Ref: B257); and
  - (u) temperature (Ref: B257);
- (2) critical exposure factors to include (Ref: C197E, pg 177):
- (a) type of particulate involved (Ref: C197E, pg 177);
  - (b) length of exposure (Ref: C197E, pg 177);
  - (c) particulate concentration (Ref: C197E, pg 177-178); and
  - (d) particulate size (Ref: C197E, pg 178-179);
- (3) biological reaction (Ref: C197E, pg 179-180);

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- (4) selected particulates to include:
  - (a) silica (Ref: C197E, pg 180 paras 1-3);
  - (b) asbestos (Ref: C197E, pg 182 paras 1-3);
  - (c) lead (Ref: C197E, pg 186 paras 1-2);
  - (d) beryllium (Ref: C197E, pg 187 paras 1-4);
  - (e) miscellaneous dusts (Ref: C197E, pg 188 paras 1-4);
  - (f) toxic dusts and fumes (Ref: C197E, pg 188);
  - (g) welding fumes (Ref: C197E, pg 188-189);
  - (h) radioactive dusts (Ref: C197E, pg 189);
  - (i) bacteria and fungi (Ref: C197E, pg 189-190); and
  - (j) allergens (Ref: C197E, pg 190); and
- (5) control of particulates to include (Ref: C197E, pg 192):
  - (a) engineering controls (Ref: C197E, pg 192-194);
  - (b) administrative controls (Ref: C197E, pg 194); and
  - (c) PPE (Ref: C197E, pg 194-195);
- g. describe ionizing radiation with specific attention to:
  - (1) basic principles (Ref: C197E, pg 247-248);
  - (2) types of ionizing radiation to include (Ref: C197E, pg 251-525):
    - (a) alpha-particles (Ref: C197E, pg 252);
    - (b) beta-particles (Ref: C197E, pg 252-253);
    - (c) neutrons (Ref: C197E, pg 253);

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- (d) x-radiation (Ref: C197E, pg 253-254); and
    - (e) gamma-radiation (Ref: C197E, pg 254); and
  - (3) biological effects of radiation to include (Ref: C197E, pg 255-256):
    - (a) types of injuries (Ref: C197E, pg 256-257);
- h. describe ergonomics with specific attention to (Ref: B20E Vol 2, pg 34-22 paras 1-3):
  - (1) ambient lighting (Ref: B20E Vol 2, pg 52.9 – 52.10);
  - (2) medical surveillance (Ref: B20E Vol 2, pg 52.12 – 52.13);
  - (3) musculoskeletal disorders (Ref: B20E Vol 2, pg 52.21 paras 1-3); and
  - (4) Video Display Terminals (VDT) (Ref: C197E);
- i. describe biological hazards with specific attention to:
  - (1) basic principles (Ref: C197E, pg 403-404);
  - (2) biological safety (Ref: C197E, pg 404);
  - (3) hazard identification to include (Ref: C197E, pg 404):
    - (a) micro-organisms (Ref: C197E, pg 404-405); and
    - (b) infection (Ref: C197E, pg 405-406); and
  - (4) risk assessment to include (Ref: C197E, pg 410):
    - (a) modes of transmission (Ref: C197E, pg 410-411);
    - (b) routes of entry (Ref: C197E, pg 411);
    - (c) infectious dose (Ref: C197E, pg 411); and
    - (d) viability and virulence of the agent (Ref: C197E, pg 411-412); and

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- j. describe mould with specific attention to:
  - (1) types and causes of mould to include:
    - (a) what are moulds (Ref: B38E, pg 2);
    - (b) causes of mould growth (Ref: B38E, pg 4);
    - (c) types of mould (Ref: B38E, pg 5);
    - (d) how moulds grow (Ref: B38E, pg 10); and
    - (e) where moulds grow (Ref: B38E, pg 11);
  - (2) health effects of mould exposure to include:
    - (a) difficulties linking health effects to mould exposure (Ref: B38E, pg 14); and
    - (b) common health effects of mould exposure (Ref: B38E, pg 15);
  - (3) mould problems in the workplace to include:
    - (a) why be concerned about mould (Ref: B38E, pg 20);
    - (b) who should be concerned about mould (Ref: B38E, pg 21);
    - (c) knowing if your workplace has a mould problem (Ref: B38E, pg 21);
    - (d) air sampling and laboratory analysis (Ref: B38E, pg 27); and
    - (e) employee health survey (Ref: B38E, pg 29);
  - (4) dealing with mould to include:
    - (a) if you suspect mould (Ref: B38E, pg 34);
    - (b) when mould is found (Ref: B38E, pg 35); and
    - (c) controlling and mitigating mould growth (Ref: B38E, pg 37);

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- (5) interpretation of mould measurement data to include:
  - (a) comparing mould measurement data with standards (Ref: B38E, pg 40); and
- (6) mould clean up and prevention to include:
  - (a) why clean up mould (Ref: B38E, pg 44);
  - (b) general guidelines for mould clean up (Ref: B38E, pg 45);
  - (c) mould clean up methods (Ref: B38E, pg 47); and
  - (d) knowing when the mould remediation or clean up is finished (Ref: B38E, pg 55).

5. **Time:**

- a. 107 x 50 min pds – IL/CS); and
- b. 6 x 50 min pds – assignment debrief.

Total EO time = 5650 min.

6. **Method of Instruction:**

- a. IL (interactive lecture); and
- b. CS (case study).

7. **Substantiation:**

- a. IL (the interactive lecture method is used to present the students with an oral presentation where they can participate by asking questions, commenting or responding to instructor questions); and
- b. CS (the students respond to the description of a scenario related to the target performance, examining the facts and incidents of the case, to critically analyze them and develop solutions).

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8. **References:**

- a. B18E The Occupational Environment: Its Evaluation & Control. Washington, D.C: National Institute for Occupational Safety and Health, c1973  
<http://www.cdc.gov/niosh/nmam/chaps.html>);
- b. B20E Encyclopaedia of Occupational Health and Safety. Vol 1-4 - 4th ed., c1998);
- c. B38E Mould in the Workplace – A Basic Guide, Canadian Centre for Occupation Health and Safety);
- d. B257 PMed 6A Reference Handouts Binder -Medical Directive 2/84); and
- e. C197E Fundamental of Industrial Hygiene: Occupation Safety and Health Series. 4th ed. National Safety Council, Itasca, Ill. c1996 PMed 6A Reference Handouts Binder -Medical Directive 2/84.

9. **Training Aids:**

- a. handout: Theory, Principles and Practices of IH by JP Farant.

10. **Learning Aids:**

- a. student handout); and
- b. study case.

11. **Test Details:**

- a. this EO will be divided in six easily managed sections of which each will be evaluated by the instructor through individual assignments (Exercises 1 to 6). The assignment will be assessed as **satisfactory/unsatisfactory**. The PMed Tech QL6A student must achieve a minimum of 70% to meet the standard. Due to the critical nature of the material learned in this EO, the PMed Tech QL6A student's knowledge will be verified and confirmed throughout the entire course in other homework and practical assignments); and
- b. due to the critical nature of this knowledge, practical application will be verified in both PC 003 and PC 004.

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12. **Remarks:**

- a. student handbook may include student-required readings, math calculations and problems, case studies, scenarios, equipment tool outline and other student tools); and
- b. the assignment will be given after each block of instruction. The blocks will be separated as:
  - (1) Block 1 – teaching points 1 to 3);
  - (2) Block 2 – teaching point 4);
  - (3) Block 3 – teaching point 5);
  - (4) Block 4 – teaching point 6);
  - (5) Block 5 – teaching points 7 to 9); and
  - (6) Block 6 – teaching point 10.

**EO 003.03**

1. **Performance:** Describe Common Industrial Processes.
2. **Conditions:**
  - a. given:
    - (1) references;
    - (2) access to a workshop; and
    - (3) case study; and
  - b. denied: assistance and/or supervision.
3. **Standard:** IAW with specified references the PMed Tech QL6A student will describe common industrial processes by:
  - a. discussing the principles and theories of industrial processes; and
  - b. interpreting various types of manufacturing to include health hazards related to the processes.
4. **Teaching Points:**
  - a. describe common workplace operations with specific attention to:
    - (1) welding, cutting and allied operations (Ref: B257, pg 143); and
    - (2) health hazards associated with welding operations to include (Ref: B257, pg 145):
      - (a) shielded metal arc (SMA) welding (rod, stick welding) (Ref: B257, pg 145-148); and
      - (b) gas-shielded metal arc welding semi-automatic welding (Ref: B257, pg 149-150);
  - b. describe health hazards associated with Tungsten Inert Gas (TIG) and Metal Inert Gas (MIG) welding (Ref: B257, pg 151);
  - c. describe other types of welding processes;
  - d. describe submerged arc welding (Ref: B257, pg 151);

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- e. describe cutting, scarfing and gouging (Ref: B257, pg 152);
- f. describe brazing (Ref: B257, pg 152-154);
- g. describe metal thermal spraying. (Ref: B257, pg 154-155);
- h. describe degreasing (Ref: B257, pg 155-159);
- i. describe metal cleaning (Ref: B257, pg 160-161);
- j. describe electroplating (Ref: B257, pg 161-163);
- k. describe metal machining (Ref: B257, pg 164-165);
- l. describe heat treating (Ref: B257, pg 166);
- m. describe painting (Ref: B257, pg 167-168);
- n. describe woodworking processes with specific attention to (Ref: B20E, pg 86.2 paras 1-13):
  - (1) flowchart for wood furniture manufacturing (Ref: B20E, pg 86.3);
  - (2) machining safety (Ref: B20E, pg 86.2-86.5);
  - (3) wood dust hazards (Ref: B20E, pg 86.5);
  - (4) assembly hazards (Ref: B20E, pg 86.5-86.6); and
  - (5) finishing hazards (Ref: B20E, pg 86.6); and
- o. describe the nature of common industrial products with specific attention to:
  - (1) organic high polymers (Ref: B257, pg 169-170);
  - (2) plastics (Ref: B257, pg 171-174);
  - (3) elastomers (Ref: B257, pg 175-176); and
  - (4) synthetic fibers (Ref: B257, pg 177).

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5. **Time:**

- a. 14 x 50 min pds – IL;
- b. 4 x 50 min pds – D; and
- c. 7 x 50 min pds – EC.

Total EO time = 900 min; and

Total EC time = 350 min.

6. **Method of Instruction:**

- a. IL interactive lecture; and
- b. D demonstration (shop visits/presentation).

7. **Substantiation:**

- a. IL the interactive lecture method is used to present students with an oral presentation where they can participate by asking questions, commenting or responding to instructor questions; and
- b. D the demonstration method is used to provide the student with a correct and detailed example of the procedure.

8. **References:**

- a. B20E Encyclopedia of occupational health and safety. Vol 1, 4th ed., c1998; and
- b. B257 Recognition of Health Hazards in Industry Author: William A. Burgess.

9. **Training Aids:**

- a. B257: Recognition of Health Hazards in Industry Author: William A. Burgess (held in PMed Lab and PMed Trg Cell).

10. **Learning Aids:**

- a. student B257.

**EO 003.03**

11. **Test Details:** the PMed Tech QL6A student will describe common industrial processes by developing a detail practical flowchart and conduct a presentation IAW the following criteria:

- a. develop a detailed flowchart of an industrial process with specific attention to:
  - (1) receiving of the raw material;
  - (2) handling the raw material;
  - (3) storage of raw material;
  - (4) transport raw material from storage to process;
  - (5) processing of raw material;
  - (6) assembly of material into product;
  - (7) disposal of waste materials;
  - (8) final product;
  - (9) transport of final product to storage; and
  - (10) distribution of products;
- b. report the flowchart in a 10 minute presentation to the class by:
  - (1) using appropriate selection of media and providing a B257 to the class; and
  - (2) be prepared for a 5 minute post-presentation discussion;
- c. the PMed Tech QL6A student's flowchart and presentation will be assessed separately as **satisfactory/unsatisfactory**. Due to the critical nature of the material learned in this EO, the student's knowledge will be verified and confirmed throughout the entire course in other homework and practical assignments; and
- d. due to the critical nature of this knowledge, practical application will be verified in both PC 003 and PC 004.

12. **Remarks:** arrangement will be made to access various workshops to view processes.

**EO 003.04**

1. **Performance:** Apply Theories and Principles of Ventilation.
2. **Conditions:**
  - a. given:
    - (1) references;
    - (2) equipment:
      - (a) Alnor;
      - (b) Accu-Balance; and
      - (c) Veloci-Cal; and
    - (3) access to PMed Lab; and
  - b. denied: assistance and/or supervision.
3. **Standard:** IAW specified references the PMed Tech QL6A student will apply theories and principles of ventilation by:
  - a. employing problem solving skills to practical applications;
  - b. demonstrating mathematical problem solving techniques and operation of data gathering equipment for industrial health work place situations involving ventilation;
  - c. demonstrating the theoretical engineering principles of ventilation; and
  - d. evaluating ventilation systems using appropriate equipment.
4. **Teaching Points:**
  - a. explain the general principles of ventilation with specific attention to:
    - (1) basic principles (Refs: C197E, pg 541; C205E, pg 1-2 art 1.1);
    - (2) supply systems (Ref: C205E, pg 1-2 art 1.2);
    - (3) exhaust systems to include:
      - (a) general/local (Ref: C205E, pg 1-2 art 1.3);

**EO 003.04**

- (4) basic definitions to include (Ref: C205E, pg 1-3 art 1.4):
    - (a) standard conditions (Refs: C197E, pg 554; C205E, pg 1-3);
    - (b) pressure (Ref: C197E, pg 554);
    - (c) static pressure (Refs: C197E, pg 554; C205E, pg 1-3);
    - (d) velocity pressure (Refs: C197E, pg 554; C205E, pg 1-3);
    - (e) total pressure (Refs: C197E, pg 554; C205E, pg 1-4);
    - (f) flow rate (Ref: C197E, pg 544);
    - (g) hood entry loss (Refs: C197E, pg 544; C205E, pg 1-6 and 1-7);
    - (h) loss factor (Refs: C197E, pg 544; C205E, pg 1-7 and 1-8); and
    - (i) coefficient of entry (Refs: C197E, pg 544; C205E, pg 1-7);
  - (5) principles of air flow (Ref: C205E, pg 1-4 and 1-5 art 1.5);
  - (6) accelerations of hood and entry losses (Ref: C205E, pg 1-6 and 1-7 art 1.6);
  - (7) duct losses (Ref: C205E, pg 1-7 and 1-9 art 1.7);
  - (8) multiple-hood exhaust systems (Refs: C197E, pg 562-563; C205E, pg 1-9 art 1.8); and
  - (9) air flow characteristics of blowing and exhausting (Ref: C205E, pg 1-10 art 1.9);
- b. explain general industrial ventilation with specific attention to:
- (1) basic principles (Ref: C205E, pg 2-2 art 2.1);
  - (2) dilution ventilation principles (Ref: C205E, pg 2-2 art 2.2);
  - (3) dilution ventilation for health (Ref: C205E, pg 2-2 art 2.3);
  - (4) mixtures – dilution ventilation for health (Ref: C205E, pg 2-6 and 2.7 art 2.4);

**EO 003.04**

- (5) dilution ventilation for fire and explosion (Ref: C205E, pg 2-7 art 2.5);
  - (6) fire dilution ventilation for mixtures (Ref: C205E, pg 2-8 art 2.6); and
  - (7) ventilation for heat control (Ref: C205E, pg 2-8 art 2.7);
- c. explain local exhaust hoods with specific attention to:
- (1) basic principles (Ref: C205E, pg 3-2 art 3.1);
  - (2) contaminant characteristics (Ref: C205E, pg 3-2 art 3.2);
  - (3) hood types (Ref: C205E, pg 3-2 art 3.3);
  - (4) hood design factors to include (Ref: C205E, pg 3-2 art 3.4):
    - (a) hood types (Ref: C205E, pg 3-2 art 3.3, and 3-12 fig 3.11);
  - (5) hood losses (Ref: C205E, pg 3-15, 3-17 art 3.5);
  - (6) minimum duct velocity (Ref: C205E, pg 3-18 art 3.6);
  - (7) special hood requirements (Ref: C205E, pg 3-18 art 3.7); and
  - (8) hot processes (Ref: C205E, pg 3-19 – 3.21 art 3.8);
- d. explain air cleaning devices with specific attention to:
- (1) basic principles (Ref: C205E, pg 4-2 art 4.1);
  - (2) selection of dust collection equipment (Ref: C205E, pg 4-2 – 4-3 art 4.2);
  - (3) dust collector type (Ref: C205E, pg 4-3 – 4-23 art 4.3);
  - (4) control of mist gas, and vapour contaminant (Ref: C205E, pg 4-23 art 4.5);
  - (5) gaseous contaminant collectors (Ref: C205E, pg 4-23 – 4-29 art 4.6);
  - (6) unit collector (Ref: C205E, pg 4-29 art 4.7);
  - (7) selection of filtration equipment (Ref: C205E, pg 4-30 – 4.34 art 4.9);

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- (8) radioactive and high toxicity operations (Ref: C205E, pg 4-34 – 4-35 art 4.10); and
- (9) explosion venting (Ref: C205E, pg 4-35 – 4-36 art 4.11);
- e. explain fans with specific attention to:
  - (1) basic principles (Refs: C197E, pg 568; C205E, pg 6-2 art 6.1); and
  - (2) basic definition (Refs: C197E, pg 568-570; C205E, pg 6-2 art 6.2);
- f. recognize specific operations with specific attention to the following (Ref: C205E, pg 10-1 paras 1-3):
  - (1) battery charging (Ref: C205E, pg 10-6 – 10-7);
  - (2) clean rooms (Ref: C205E, pg 10-10);
  - (3) gas treatment (Ref: C205E, pg 10-28);
  - (4) kitchen equipment (Ref: C205E, pg 10-35);
  - (5) laboratory ventilation (Ref: C205E, pg 10-40 – 10-41);
  - (6) machining (Ref: C205E, pg 10-61 – 10-62);
  - (7) movable exhaust hoods (Ref: C205E, pg 10-95);
  - (8) open surface tank (Ref: C205E, pg 10-99);
  - (9) push-pull ventilation to include (Ref: C205E, pg 10-113):
    - (a) exhaust hood and exhaust flow (Ref: C205E, pg 10-115); and
    - (b) non open surface tank processes (Ref: C205E, pg 10-116);
  - (10) painting operations (Ref: C205E, pg 10-118);
  - (11) mechanical surface cleaning and finishing (Ref: C205E, pg 10-128);
  - (12) vehicle ventilation (Ref: C205E, pg 10-148);

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- (13) welding and cutting to include (Ref: C205E, pg 10-153):
    - (a) general recommendations (Ref: C205E, pg 10-153);
  - (14) woodworking (Ref: C205E, pg 10-160); and
  - (15) miscellaneous operations (Ref: C205E, pg 10-177 – 10-84 (ranges) (range design));
- g. explain ventilation aspects of IAQ with specific attention to:
- (1) basic principles (Ref: C205E, pg 8-2 art 8.1);
  - (2) dilution ventilation for IAQ (Ref: C205E, pg 8-2 art 8.2);
  - (3) Heating, Ventilation and Air Condition (HVAC) components and system types (Ref: C205E, pg 8-2 – 8-11 art 8.3);
  - (4) HVAC components, functions and malfunctions to include (Ref: C205E, pg 8-11 art 8.4):
    - (a) outdoor air;
    - (b) dampers;
    - (c) air cleaning;
    - (d) heating/cooling coils;
    - (e) fans;
    - (f) humidifiers/dehumidifiers;
    - (g) supply air distribution;
    - (h) return air grilles; and
    - (i) return air;
  - (5) HVAC standards maintaining adequate IAQ (Ref: C197E, pg 600-602);
  - (6) trouble shooting HVAC systems (Ref: C197E, pg 605-606); and
  - (7) operation and maintenance (Ref: C197E, pg 606); and

**EO 003.04**

- h. explain the monitoring and testing of ventilation systems with specific attention to:
- (1) basic principles (Ref: C205E, pg 9-2 art 9.1);
  - (2) computing air velocity and airflow rate (Ref: C205E, pg 9-3 – 9-8 art 9.2);
  - (3) representation sampling for velocities (Ref: C205E, pg 9-9 – 9-15 art 9.3 (RA));
  - (4) pressure measurement to include (Ref: C205E, pg 9-15 – 9-16 art 9.4 (RA)):
    - (a) using pitot tubes with pressure sensor (Ref: C205E, pg 9-16 – 9-19 art 9.5);
  - (5) selection and use of instruments (Ref: C205E, pg 9-19 – 9-29 art 9.6 (RA));
  - (6) calibration (Ref: C205E, pg 9-29 – 9-34 art 9.7 (RA));
  - (7) practical issues in ventilation system measurement (Ref: C205E, pg 9-34 – 9-35 art (RA)); and
  - (8) monitoring a system (Ref: C205E, pg 9-35 art 9.9 (RA)).

5. **Time:**

- a. 14 x 50 min pds – IL/D;
- b. 7 x 50 min pds – practical EC; and
- c. 2 x 50 min pds – written EC.

Total EO time = 700 min; and

Total EC time = 450 min.

**EO 003.04**

6. **Method of Instruction:**

- a. IL interactive lecture; and
- b. D demonstration.

7. **Substantiation:**

- a. IL the interactive lecture method is used to present students with an oral presentation where they can participate by asking questions, commenting or responding to instructor questions; and
- b. D the demonstration method is used to provide the student with a correct and detailed example of the procedure.

8. **References:**

- a. C197E Fundamental of Industrial Hygiene: occupation safety and health series. 4th Ed. National Safety Council, Itasca, Ill. c1996; and
- b. C205E Industrial ventilation: a manual of recommended practice, 25th ed. American Conference of Governmental Industrial Hygienists. C2004.

9. **Training Aids:**

- a. nil.

10. **Learning Aids:**

- a. student handout.

11. **Test Details:**

- a. the PMed Tech QL6A student shall apply theories and principles of ventilation through a minimum of two homework assignments; and
- b. the PMed Tech QL6A student shall use the ventilation equipment IAW a checklist and will be assessed practically as **satisfactory/unsatisfactory**.

**EO 003.04**

12. **Remarks:**

- a. arrangements will be made to access the ventilation room of the school; and
- b. due to the critical nature of this knowledge, practical application will be verified in both PC 003 and PC 004.

**EO 003.05**

1. **Performance:** Determine Methods of Controlling Occupational Exposures.
2. **Conditions:**
  - a. given:
    - (1) references; and
    - (2) peer assistance; and
  - b. denied: supervision.
3. **Standard:** IAW specified references the PMed Tech QL6A student will determine methods of controlling occupational exposures by associating the theoretical knowledge of hazards and processes to the appropriate control measures.
4. **Teaching Points:**
  - a. determine methods of control with specific attention to (Ref: C197E, pg 531 paras 1-4):
    - (1) types of control to include (Ref: C197E, pg 532):
      - (a) engineering controls;
      - (b) administrative controls; and
      - (c) PPE;
    - (2) engineering controls to include (Ref: C197E, pg 532-533 paras 6-7):
      - (a) substitution: changing the material (Ref: C197E, pg 537-538);
      - (b) substitution: changing the process (Ref: C197E, pg 538);
      - (c) isolation (Ref: C197E, pg 538-541); and
      - (d) ventilation (Ref: C197E, pg 541-543);
    - (3) administrative controls to include (Ref: C197E, pg 543 para 8):
      - (a) reduction of work period (Ref: C197E, pg 543-544);
      - (b) wet methods (Ref: C197E, pg 544);

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- (c) personal hygiene (Ref: C197E, pg 544-545);
- (d) housekeeping and maintenance (Ref: C197E, pg 545); and
- (e) maintenance provisions (Ref: C197E, pg 545);
- (4) special control methods (Ref: C197E, pg 546);
- (5) waste disposal (Ref: C197E, pg 546);
- (6) PPE to include (Ref: C197E, pg 546 paras 9-10):
  - (a) protective clothing (Ref: C197E, pg 548-549);
  - (b) eye and face protection (Ref: C197E, pg 549, B20E vol 1 section 31.3 – 31.4); and
  - (c) hearing protection (Ref: C197E, pg 549-550); and
- (7) education and training (Ref: C197E, pg 550-551); and
- b. determine appropriate respiratory protection with specific attention to:
  - (1) classes of respiratory protective devices to include (Ref: C197E, pg 626 para 2):
    - (a) air purifying respirators (Ref: C197E, pg 626 para 2);
    - (b) atmosphere supplying respirators (Ref: C197E, pg 634 para 2); and
    - (c) combination air-purifying and atmosphere-supplying device (Ref: C197E, pg 638 para 4);
  - (2) respirator classification to include (Ref: C197E, pg 626 para 3):
    - (a) quarter face;
    - (b) half face; and
    - (c) full face;

**EO 003.05**

- (3) air purifying devices to include:
  - (a) aerosol-removing respirators (Ref: C197E, pg 626-630);
  - (b) gas/vapour-removing respirators (Ref: C197E, pg 630-632);
  - (c) combination aerosol filter/gas or vapour-removing respirators (Ref: C197E, pg 632-633); and
  - (d) powered air purifying respirators (Ref: C197E, pg 633-634);
- (4) atmosphere supplying respirators to include (Ref: C197E, pg 634 para 2):
  - (a) air line respirators (Ref: C197E, pg 634-636);
  - (b) Self-Contained Breathing Apparatus (Ref: C197E, pg 636-637); and
  - (c) the combination of Self-Contained Breathing Apparatus and air line respirators (Ref: C197E, pg 637-638);
- (5) combination air purifying and atmosphere supplying devices (Ref: C197E, pg 638-639);
- (6) respirator selection (Ref: C197E, pg 639, C94E, pg 14-16);
- (7) hazard determination (including skin absorption and warning properties) (Ref: C197E, pg 640-641);
- (8) Immediately Dangerous to Life or Health (IDLH) (Ref: C197E, pg 641-642);
- (9) Lower Explosive Limit (LEL) and fire fighting (Ref: C197E, pg 642);
- (10) Assigned Protection Factors (APF) (Ref: C197E, pg 643);
- (11) selection of respirators B196E part 3, pg 32-36);
- (12) respirator fit testing to include:
  - (a) qualitative fit testing (Ref: C197E, pg 645); and
  - (b) quantitative fit testing (Ref: C197E, pg 649-651); and

**EO 003.05**

- (13) cleaning, maintenance, inspection and storage to include (Ref: C197E, pg 623):
- (a) cleaning and sanitizing (Ref: C197E, pg 623);
  - (b) inspection (Ref: C197E, pg 623);
  - (c) repair (Ref: C197E, pg 623); and
  - (d) storage (Ref: C197E, pg 623).

5. **Time:**

- a. 17 x 50 min pds – IL/D; and
- b. 2 x 50 min pds – assignment debrief.

Total EO time = 750 min.

6. **Method of Instruction:**

- a. IL interactive lecture; and
- b. D demonstration.

7. **Substantiation:**

- a. IL the interactive lecture method is used to present students with an oral presentation where they can participate by asking questions, commenting or responding to instructor questions; and
- b. D the demonstration method is used to provide the student with a correct and detailed example of the procedure.

8. **References:**

- a. B20E Encyclopedia of Occupational Health and Safety. Vol 1-4 - 4th ed., c1998;
- b. B196E Department of National Defence Respiratory Protection Program = Ministère de la Défense Nationale - Programme de protection des voies respiratoires. 2005/2006  
[http://otgmati000041.ottawa-hull.mil.ca/servlet/dticsGetDocument?r\\_object\\_id=09000fa0800bd1a4](http://otgmati000041.ottawa-hull.mil.ca/servlet/dticsGetDocument?r_object_id=09000fa0800bd1a4);

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- c. C94E Selection, Use and Care of Respirators (reaffirmed 1997) CAN/DSA-Z94, 4-93. A National Standard of Canada. CSA - Toronto, ON. c2002; and
- d. C197E Fundamental of Industrial Hygiene: occupation safety and health series. 4th ed. National Safety Council, Itasca, Ill. c1996.

9. **Training Aids:**

- a. 2 x firefighter films (respiratory protection).

10. **Learning Aids:**

- a. student handbook.

11. **Test Details:**

- a. the PMed Tech QL6A student shall determine methods of controlling occupational exposures through a homework assignment (EC) where the student must obtain a minimum of 70% for a satisfactory result; and
- b. due to the critical nature of this knowledge, practical application will be verified in both PC 003 and PC 004.

12. **Remarks:** nil.

**EO 003.06**

1. **Performance:** Collect Occupational Health Risk Data.
2. **Conditions:**
  - a. given:
    - (1) references;
    - (2) access to industrial processes (facilities);
    - (3) instructor supervision;
    - (4) peers assistance;
    - (5) PPE; and
    - (6) checklist; and
  - b. denied: nil.
3. **Standard:** IAW specified references the PMed Tech QL6A student shall collect occupational health risk data, paying specific attention to:
  - a. gathering information from research, interviews and investigations;
  - b. identifying existing on-site health hazards and potential sources;
  - c. identifying existing control measures; and
  - d. compiling detailed information IAW the student handbook.
4. **Teaching Points:**
  - a. describe general principles and theories for gathering and collecting data (Ref: C197E, pg 453-454);
  - b. describe the basic approach to hazard recognition (Ref: C197E, pg 454);
  - c. explain the use and importance of a literature review that should be conducted prior to data collection (including all CF occupational programs) (Ref: C197E, pg 454-455);

**EO 003.06**

- d. describe the inventory process (Ref: C197E, pg 455);
- e. describe the various processes or operations that students will be encountering (Ref: C197E, pg 455-546);
- f. describe the process flow sheet (Ref: C197E, pg 456-458);
- g. describe the checklists with specific attention to (Ref: C197E, pg 458):
  - (1) overall process or operation (Ref: C197E, pg 458); and
  - (2) equipment (Ref: C197E, pg 458-459);
- h. describe cleaning methods (Ref: C197E, pg 459);
- i. describe process safety management (Ref: C197E, pg 459-460); and
- j. perform a field survey with specific attention to (Ref: C197E, pg 460):
  - (1) sensory perception (Ref: C197E, pg 460-461);
  - (2) control measures in use (Ref: C197E, pg 461); and
  - (3) observations and interview (Ref: C197E, pg 461).

5. **Time:**

- a. 7 x 50 min pds – IL/D;
- b. 6 x 50 min pds – PE; and
- c. 2 x 50 min pds – debrief/GD.

Total EO time = 800 min.

6. **Method of Instruction:**

- a. IL interactive lecture;
- b. D demonstration;
- c. PE practical exercise; and
- d. GD guided discussion.

**EO 003.06**

7. **Substantiation:**

- a. IL the interactive lecture method is used to present students with an oral presentation where they can participate by asking question, commenting or responding to instructor questions;
- b. D the demonstration method is used to provide the student with a correct and detailed example of the procedure;
- c. PE the practical exercise method is used to allow students to practice and correct errors while progressing through the exercise; and
- d. GD students discuss issues to share knowledge, opinions and feelings about the subject matter. A facilitator guides and mediates the exchange.

8. **References:**

- a. C197E Fundamental of Industrial Hygiene: occupation safety and health series. 4th ed. National Safety Council, Itasca, Ill. c1996.

9. **Training Aids:**

- a. nil.

10. **Learning Aids:**

- a. PPE checklist;
- b. equipment/supplies checklist;
- c. hygiene walkthrough survey checklist;
- d. pre-walkthrough activities checklist;
- e. conducting the walkthrough survey checklist; and
- f. site walkthrough tour checklist.

11. **Test Details:** the PMed Tech QL6A student shall collect occupational health risk data through a practical exercise. Contents of file folder will be assessed IAW the checklist. The students will be assessed as **satisfactory/unsatisfactory**. A one-on-one debrief will offer the student an opportunity to receive feedback on their assessment prior to writing a report (EO 003.07) and how to gather data for PC 003.

**EO 003.06**

12. **Remarks:**

- a. the data from EO 003.06 must be retained for report writing on EO 003.07;
- b. there will be an oral board conducted at the end of PO 004, which will test the performance objectives of PO 003 and PO 004;
- c. due to the critical nature of the material learned in this EO, the PMed Tech QL6A student's knowledge will be verified and confirmed in a practical PC 003. The practical PC will consist of 2 parts: a complete inspection of a facility and a detailed written report. The PMed Tech QL6A student will complete the inspection in teams of three and the report will be conducted individually. The student will be assessed as **pass/fail** IAW checklists for the inspection and written report; and
- d. arrangements will be made to access workshops.

**EO 003.07**

1. **Performance:** Write an Occupational Health Inspection Report.
2. **Conditions:**
  - a. given:
    - (1) references;
    - (2) completed checklist/information from inspection;
    - (3) computer (DWAN); and
    - (4) peer assistance; and
  - b. denied: instructor supervision.
3. **Standard:** IAW specified references the PMed Tech QL6A student will write an occupational health inspection report to the Chain of Command with specific attention to:
  - a. analyzing data/observations;
  - b. integrating information; and
  - c. formulating conclusions and recommendations.
4. **Teaching Points:**
  - a. write a comprehensive inspection report with specific attention to (Ref: A80B):
    - (1) the circumstances leading up to the inspection;
    - (2) workplace description;
    - (3) provides results of preliminary assessment to include:
      - (a) personal control measures;
      - (b) collective control measures;
      - (c) PPE; and
      - (d) respiratory protection;

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- (4) identify all potential health hazards;
  - (5) formulate interim recommendations;
  - (6) advise on occupational medical measures;
  - (7) identify requirement for occupational health survey; and
  - (8) promote occupational health programmes; and
- b. complete schematic of floor plan and flow chart **if required.**

5. **Time:**

- a. 1 x 50 min pd – GD;
- b. 7 x 50 min pds – PE; and
- c. 4 x 50 min pds – debrief.

Total EO time = 600 min.

6. **Method of Instruction:**

- a. GD guided discussion; and
- b. PE practical exercise.

7. **Substantiation:**

- a. GD student discuss issues to share knowledge, opinions and feelings about the subject matter. A facilitator guides and mediates the exchange; and
- b. PE the practical exercise method is used to allow students to practice and correct errors while progressing through the exercise.

**EO 003.07**

8. **References:**

- a. A80B Staff and writing procedures for the Department of National Defence and the Canadian Forces = Procédures d'état-major et correspondance du ministère de la Défense Nationale et des Forces canadiennes. Ottawa, ON.: DND, c.1990  
<http://otgmati000041.ottawa-hull.mil.ca/docFetch?objId=09000fa0800a717a&format=pdf>.

9. **Training Aids:**

- a. nil.

10. **Learning Aids:**

- a. service paper template; and
- b. checklist.

11. **Test Details:**

- a. the student shall write an occupational health inspection report through a comprehensive written report in a service paper format that conforms to CF writing policy with specific attention to:
  - (1) advise on control measures;
  - (2) advise on occupational medical measures;
  - (3) advise on PPE;
  - (4) advise on respiratory protection; and
  - (5) promote occupational health programs;
- b. the student will submit the report with corrected file folder from EC 003.06; and
- c. the student will be provided with the appropriate service paper template. The student will be assessed as satisfactory/unsatisfactory. This will offer the student an opportunity to correct deficiencies in report writing prior to conducting PC 003.

**EO 003.07**

12. **Remarks:**

- a. there will be an oral board conducted at the end of PO 004, which will test the performance objectives of PO 003 and PO 004; and
- b. due to the critical nature of the material learned in this EO, the PMed Tech QL6A student's knowledge will be verified and confirmed in a practical PC. The practical PC will consist of 2 parts: a full risk assessment (which includes an inspection of a facility) and a detailed written report. The PMed Tech QL6A student will complete the inspection in teams of three and written report individually. The PMed Tech QL6A student will be assessed as **pass/fail** IAW checklists for the risk assessments and written report.fx

**EO 004.01**

1. **Performance:** Apply Theories and Principles to Sampling.
2. **Conditions:**
  - a. given:
    - (1) references;
    - (2) equipment;
    - (3) sampling media; and
    - (4) peer assistance; and
  - b. denied: supervision.
3. **Standard:** IAW specified reference the PMed Tech QL6A student will apply theories and principles to sampling with specific attention to:
  - a. selecting the appropriate sampling methods; and
  - b. demonstrating analytical problem solving skills to interpret results.
4. **Teaching Points:**
  - a. explain monitoring and sampling with specific attention to:
    - (1) rational (Ref: C197E, pg 461);
    - (2) monitoring (Ref: C197E, pg 461);
    - (3) personal monitoring (Ref: C197E, pg 461-463);
    - (4) area monitoring (Ref: C197E, pg 463-464); and
    - (5) biological monitoring and screening to include (Ref: C197E, pg 464-465):
      - (a) medical surveillance (Ref: C197E, pg 465-466);
      - (b) biological exposure indices (Ref: C197E, pg 466);
      - (c) combined effects (Ref: C197E, pg 466-467); and
      - (d) limitations of biological monitoring (Ref: C197E, pg 467);

**EO 004.01**

- b. explain sampling with specific attention to:
  - (1) strategy (Ref: C197E, pg 467-468);
  - (2) what and how to sample (Ref: C197E, pg 468);
  - (3) where to sample (Ref: C197E, pg 468);
  - (4) whom to sample (Ref: C197E, pg 468-469);
  - (5) when to sample (Ref: C197E, pg 469-470);
  - (6) how long to sample (Ref: C197E, pg 470);
  - (7) what to note during sampling (Ref: C197E, pg 470);
  - (8) how many samples to take (Ref: C197E, pg 470);
  - (9) when to stop monitoring (Ref: C197E, pg 470 and 472);
  - (10) who should conduct sampling (Ref: C197E, pg 472); and
  - (11) required accuracy and precision to include (Ref: C197E, pg 472):
    - (a) accuracy (Ref: C197E, pg 472); and
    - (b) precision (Ref: C197E, pg 472-473);
- c. describe NIOSH Manual of Analytical Methods (NMAM) to include:
  - (1) purpose and scope (Ref: B18E chap A); and
  - (2) how to use NMAM (Ref: B18E chap B);
- d. explain sampling methods with specific attention to (Ref: C197E, pg 494-496):
  - (1) blanks (Ref: C197E, pg 496 (last para before calibration));
- e. explain Laboratory (Ref: C197E, pg 501 fig 16-24);
- f. explain sampling technique to include (Ref: C197E, pg 500-504 fig 16-24, 16-25, 16-26):
  - (1) mould sampling technique (Ref: B38E, pg 27-28);

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- g. explain TWA (Ref: C197E, pg 477-478);
- h. explain Biological Exposure Indices (BEI) with specific attention to:
  - (1) documentation (Ref: C139E, pg 83-84);
  - (2) relationship of BEIs and TLVs (Ref: C139E, pg 84);
  - (3) specimen collection (Ref: C139E, pg 84-85);
  - (4) urine specimen acceptability (Ref: C139E, pg 85);
  - (5) quality assurance (Ref: C139E, pg 85-86);
  - (6) notations (Ref: C139E, pg 86); and
  - (7) application of BEIs (Ref: C139E, pg 86-87);
- i. describe the Interpretation of results with specific attention to (Ref: C197E, pg 479):
  - (1) comparison with standards and guidelines (Ref: C197E, pg 479-480);
  - (2) limitations of standards (Ref: C197E, pg 480-481); and
  - (3) comparison of results with other data (Ref: C197E, pg 481); and
- j. explain record keeping (Ref: C197E, pg 504).

5. **Time:**

- a. 4 x 50 min pds – IL;
- b. 3 x 50 min pds – CS;
- c. 4 x 50 min pds – PE; and
- d. 3 x 50 min pds – GD.

Total EO time = 700 min.

**EO 004.01**

6. **Method of Instruction:**

- a. IL interactive lecture;
- b. CS case study;
- c. PE practical exercise; and
- d. GD guided discussion.

7. **Substantiation:**

- a. IL the interactive lecture method is used to present trainees with an oral presentation where they can participate by asking questions, commenting or responding to instruction questions;
- b. CS students to respond to the description of a scenario related to the target performance, examining the facts and incidents of the case, to critically analyze them and develop solutions;
- c. PE the practical exercise method is used to allow students to practice and correct errors while progressing through the exercise; and
- d. GD students discuss issues to share knowledge, opinions and feelings about the subject matter. A facilitator guides and mediates the exchange.

8. **References:**

- a. B18E NIOSH Manual of Analytical Methods (NMAM) (Annex C) <http://www.cdc.gov/niosh/nmam/chaps.html>);
- b. B38E Mould in the Workplace - A Basic Guide, 1st ed., Canadian Centre for Occupational Health and Safety. c2004;
- c. C139E TLVs and BEIs Threshold Limit Values for Chemical Substances and Physical Agents. Biological Exposure Indices - Cincinnati, Ohio. ACGIH c2006; and
- d. C197E Fundamental of Industrial Hygiene: Occupation Safety and Health Series. 4th ed. National Safety Council, Itasca, Ill. c1996.

9. **Training Aids:**

- a. references.

**EO 004.01**

10. **Learning Aids:**

- a. case study; and
- b. handout prepared by the syndicate.

11. **Test Details:**

- a. the PMed Tech QL6A student shall apply theories and principles to sampling through a case study exercise where the student in a syndicate activity will be assessed as **satisfactory/unsatisfactory**. Due to the critical nature of the material learned in this EO, the student's knowledge will be verified and confirmed throughout the entire course in other homework, tests and practical assignments; and
- b. this will be presented as a handout (1 copy for each student and standards) and not as a PowerPoint presentation.

12. **Remarks:** nil.

**EO 004.02**

1. **Performance:** Perform an Occupational Health Survey.
2. **Conditions:**
  - a. given:
    - (1) references;
    - (2) occupational health inspection report;
    - (3) scenario;
    - (4) equipment;
    - (5) access to industrial workshops; and
    - (6) peer assistance; and
  - b. denied: supervision.
3. **Standard:** IAW specific references and the Survey Checklist the PMed Tech QL6A student shall perform an occupational health survey by:
  - a. evaluating information gathered from inspection;
  - b. developing a survey plan;
  - c. implementing the survey plan;
  - d. compiling survey data;
  - e. analyzing survey data; and
  - f. composing a written report with recommendations to Chain of Command.
4. **Teaching Points:**
  - a. determine the evaluating process utilizing: The Occupational Health (OH) Survey (Ref: B18E, pg 107-108);

**EO 004.02**

- b. determine the purpose and scope of survey with specific attention to (Ref: B18E, pg 108):
  - (1) comprehensive OH survey (Ref: B18E, pg 108);
  - (2) specific limited survey (Ref: B18E, pg 108); and
  - (3) compliance survey (Ref: B18E, pg 108);
- c. review past reports (Ref: B18E, pg 115-116);
- d. determine which survey will be utilized:
  - (1) preliminary (qualitative) (Ref: B18E, pg 116-117); and
  - (2) field survey (quantitative) (Ref: B18E, pg 117);
- e. estimate range of contaminant concentrations (Ref: B18E, pg 117-118);
- f. review sampling and analytical methods available (Ref: B18E, pg 118-119);
- g. select equipment (Ref: B18E, pg 119-120);
- h. select PPE (Ref: B18E, pg 120);
- i. prepare a tentative sampling strategy (Ref: B18E, pg 120-121);
- j. perform field survey with specific attention to (Ref: B18E, pg 121-122):
  - (1) where;
  - (2) when;
  - (3) whom;
  - (4) how long;
  - (5) how many to collect; and
  - (6) how to obtain sample;
- l. determine sampling/analytical procedures (Ref: B18E, pg 123-124);
- m. complete interpretation of results (Ref: B18E, pg 124);

**EO 004.02**

- n. determine TWA exposures with specific attention to (Ref: B18E, pg 124):
  - (1) analysis short term (Ref: B18E, pg 124-125);
  - (2) comparing results and standards (Ref: B18E, pg 125); and
  - (3) comparing results and previous data (Ref: B18E, pg 125);
- o. determine other evaluations involving the occupational health to complete reviews, interpretations and report results (Ref: B18E, pg 125-127); and
- p. write a comprehensive survey report with specific attention to:
  - (1) description of circumstances leading up to the survey;
  - (2) workplace description and processes;
  - (3) details pertaining to equipment and methodology utilized;
  - (4) results of monitoring or sample data;
  - (5) interpretation of sample data and observations;
  - (6) correctives measures;
  - (7) identify requirement for follow-up or further study;
  - (8) schematic of floor plan and flow chart; and
  - (9) promoting occupational health programmes.

5. **Time:**

- a. 3 x 50 min pds – IL;
- b. 5 x 50 min pds – D;
- c. 7 x 50 min pds – PE (workshop);

**EO 004.02**

- d. 7 x 50 min pds – PE (report writing); and
- e. 4 x 50 min pds – debrief.

Total EO time = 1300 min.

6. **Method of Instruction:**

- a. IL interactive lecture;
- b. D demonstration; and
- c. PE practical exercise.

7. **Substantiation:**

- a. IL the interactive lecture method is used to present students with an oral presentation where they can participate by asking questions, commenting or responding to instructor questions;
- b. D the demonstration method is used to provide the student with a correct and detailed example of the procedure; and
- c. PE the practical exercise methods is used to allow students to practice and correct errors while progressing through the exercise.

8. **References:**

- a. B18E The occupational environment: its evaluation & control. Washington, D.C: National Institute for occupational Safety and Health, c1973  
<http://www.cdc.gov/niosh/pdfs/74-177.pdf>.

9. **Training Aids:**

- a. nil.

10. **Learning Aids:**

- a. references;
- b. occupational health inspection report;
- c. scenario;

**EO 004.02**

- d. checklist (Annex A to EO 004.02);
- e. service paper example (Annex B to EO 004.02); and
- f. access to industrial workshops access to workshop.

11. **Test Details:** the PMed Tech QL6A student shall perform an occupational health survey (at the same workshop utilized during EC 003.06 and 003.07) through a practical case study exercise where the instructor will critique the student's data gathering exercise and report (including the completed checklist and report from the survey of a facility). The PMed Tech QL6A student will be assessed as **satisfactory/unsatisfactory**. A one-on-one debrief will offer the student an opportunity to receive feedback on their assessment prior to PC 004.

12. **Remarks:**

- a. the student will write a report of occupational health survey in a service paper format (Annex B to EO 004.02) including file folder IAW the checklist;
- b. due to the critical nature of the material learned in this EO, the student's knowledge will be verified and confirmed in a practical PC. The practical PC will consist of three parts: a complete survey of a facility, a detailed written report and an oral board. The student will complete the survey in teams of three and reports and oral board individually. The student will be assessed as **pass/fail** IAW checklists for the survey, written report and oral board. The oral board will be testing the knowledge learned during this entire course; and
- c. arrangements will be made to access industrial workshops.

**EO 004.03**

1. **Performance:** Perform An Indoor/Outdoor Air Quality Survey.
2. **Conditions:**
  - a. given:
    - (1) references;
    - (2) access to:
      - (a) PMed Lab; and
      - (b) industrial workplaces;
    - (3) equipment;
    - (4) scenario; and
    - (5) peer assistance; and
  - b. denied: instructor assistance.
3. **Standard:** IAW specified references the PMed Tech QL6A student will perform an indoor/outdoor air quality survey by:
  - a. evaluating information gathered;
  - b. developing a survey plan;
  - c. implementing the survey plan;
  - d. compiling survey data;
  - e. analyzing survey data; and
  - f. composing a written report with recommendations to Chain of Command.

**EO 004.03**

**4. Teaching Points:**

- a. discuss the following documents and methodologies as they relate to indoor and outdoor surveys with specific attention to: (Ref: A195E, pg 9):
  - (1) purpose of document (Ref: A195E, pg 9);
  - (2) users (Ref: A195E, pg 9); and
  - (3) investigate methods (Ref: A195E, pg 9);
  
- b. describe the following theory and principles as it relates to indoor/outdoor air quality with specific attention to (Ref: A195E, pg 10):
  - (1) sick building syndrome and related complaints (Ref: A195E, pg 10);
  - (2) factor affecting indoor air quality (Ref: A195E, pg 11); and
  - (3) ventilation guidelines (Ref: A195E, pg 11);
  
- c. apply HVAC standards for maintaining adequate IAQ to include:
  - (1) American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) 62-1989: Ventilation for acceptable air quality (Ref: C197E, pg 600-601);
  - (2) ASHRAE 55-1992: Thermal environmental conditions for human occupancy (Ref: C197E, pg 601);
  - (3) ASHRAE 52-1992: Methods of Testing Air Cleaning Devices Used in General Ventilation for Removing Particulate Matter (Ref: C197E, pg 601); and
  - (4) regulatory standards (Ref: C197E, pg 602);
  
- d. describe communication strategy (Ref: A195E, pg 13);
  
- e. perform an initial assessment to include (Ref: A195E, pg 15):
  - (1) initial walkthrough (Ref: A195E, pg 15);
  - (2) reviewing the complaint area (Ref: A195E, pg 16); and
  - (3) defining the problem and drawing conclusions (Ref: A195E, pg 17);

**EO 004.03**

- f. perform a detailed assessment to include (Ref: A195E, pg 19 – 52):
  - (1) collecting information about air quality indicators;
  - (2) sampling considerations;
  - (3) overview of monitoring methods and equipment;
  - (4) temperature and humidity;
  - (5) carbon dioxide;
  - (6) carbon monoxide;
  - (7) formaldehyde;
  - (8) particulates;
  - (9) radon (Ref: B20E vol 2, pg 44.10-44.11);
  - (10) volatile organic compounds (VOC) (Ref: A195E, pg 19 – 52); and
  - (11) microbial to include (Ref: A195E, pg 19 – 52):
    - (a) interpretation of results; and
  
- g. complete the report checklist to include:
  - (1) checklist 21-1 – Building Information Checklist (Ref: C197E, pg 610);
  - (2) checklist 21-2 – Building Owner’s HVAC Documentation and Programs (Ref: C197E, pg 611);
  - (3) checklist 21-3 – Basic Information Checklist for HVAC Systems (Ref: C197E, pg 612);
  - (4) checklist 21-4 – Checklist for HVAC Systems (Ref: C197E, pg 613);
  - (5) checklist 21-5 – Troubleshooting Checklist Typical Problems (Ref: C197E, pg 614);
  - (6) checklist for preventive and minimizing IAQ problems through good HVAC practices (Ref: C197E, pg 615);

**EO 004.03**

- (7) maintenance checklist for common HVAC Components (Ref: C197E, pg 616); and
- (8) checklist for reducing microbial problems in HVAC systems (Ref: C197E, pg 617).

5. **Time:**

- a. 7 x 50 min pds – IL;
- b. 3 x 50 min pds – D;
- c. 7 x 50 min pds – PE (survey); and
- d. 4 x 50 min pds – debrief.

Total EO time = 1050 min.

6. **Method of Instruction:**

- a. IL interactive lecture;
- b. D demonstration; and
- c. PE practical exercise.

7. **Substantiation:**

- a. IL the interactive lecture method is used to present students with an oral presentation where they can participate by asking questions, commenting or responding to instructor questions;
- b. D the demonstration method is used to provide the student with a correct and detailed example of the procedure; and
- c. PE the practical exercise methods is used to allow students to practice and correct errors while progressing through the exercise.

**EO 004.03**

8. **References:**

- a. A195B Health Canada, Indoor air quality on Office Buildings: A Technical Guide  
[http://www.hc-sc.gc.ca/ewh-semt/alt\\_formats/hecs-sesc/pdf/pubs/air/office\\_building-immeubles\\_bureaux/93ehd-dhm166\\_e.pdf](http://www.hc-sc.gc.ca/ewh-semt/alt_formats/hecs-sesc/pdf/pubs/air/office_building-immeubles_bureaux/93ehd-dhm166_e.pdf);
- b. B20E Encyclopaedia of Occupational Health and Safety. Vol 1-4, 4th ed., c1998; and
- c. C197E Fundamental of Industrial Hygiene: Occupation Safety and Health Series. 4th ed. National Safety Council, Itasca, Ill. c1996.

9. **Training Aids:**

- a. nil.

10. **Learning Aids:**

- a. references;
- b. access to industrial workplaces; and
- c. scenario.

11. **Test Details:** the PMed Tech QL6A student shall perform an indoor/outdoor air quality survey through a practical exercise including a written report and file folder. The students will be assessed as **satisfactory/unsatisfactory**.

12. **Remarks:**

- a. arrangements will made to access industrial workplaces; and
- b. although the task statement reads “Perform indoor/outdoor quality survey”, the outdoor aspect refers to the importance of taking into account the outdoor environmental conditions and contaminants when conducting an indoor air quality survey.

**WEEKLY INSTRUCTION PROGRAM - CFMSS/CFDSS**

Version: 7

Course Director  
 Directing Staff  
 Guest Speaker

- |          |           |
|----------|-----------|
| 1. _____ | 8. _____  |
| 2. _____ | 9. _____  |
| 3. _____ | 10. _____ |
| 4. _____ | 11. _____ |
| 5. _____ | _____     |
| 6. _____ | _____     |
| 7. _____ | _____     |

Course: \_\_\_\_\_  
 Session: \_\_\_\_\_  
 Instruction Week: \_\_\_\_\_

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
0730 0755					
0800 0850					
0855 0945					
<b>BREAK</b>					
1005 1055					
1100 1150					
<b>LUNCH</b>					
1300 1350					
1355 1445					
<b>BREAK</b>					
1500 1550					
1555 1645					
Evening					

ADM (A)	SCHOOL ADMINISTRATION
ADM (B)	BASE ADMINISTRATION
GL	GUEST LECTURE
TP	TEACHING POINT
D	DEMONSTRATION
P	PRACTICE
DP	DEMONSTRATION PERFORMANCE
SD	SYNDICATE DISCUSSION
F	FILM OR VHS
GD	GUIDED DISCUSSION
GE	GUIDED EXERCISE

COM LAB	COMPUTER LABORATORY
IPT	INDIVIDUAL PREP TIME
PT	PHYSICAL TRAINING
FTX	FIELD EXERCISE
RM	CLASSROOM
PH	PILLAR HALL
CH	COOPER HALL
Conf Rm	CO CFMSS/CFDSS CONF RM
SP	SYNDICATE PRESENTATIONS
VC	VIDEO CONFERENCE

**PARTS THAT MUST BE SHOWN**  
**ON A SKILL LESSON PLAN**

<b><u>TIME</u></b>	<b><u>CONTENTS</u></b>	<b><u>ACTION</u></b>
	<p style="text-align: center;"><b><u>INTRODUCTION</u></b></p> <p><b><u>WHAT</u></b> WHAT ARE YOU GOING TO TEACH?</p> <p><b><u>PERFECT DEMO</u></b> WATCH, I'LL SHOW YOU WHAT YOU WILL BE ABLE TO DO AT THE END OF THE LESSON. OR <b><u>FINISHED PRODUCT</u></b> AT THE END OF THE LESSON, THIS IS WHAT YOU'LL...</p> <p><b><u>WHERE</u></b> WHERE IT FITS IN TRAINING. WHERE IT WILL BE APPLIED.</p> <p><b><u>WHY</u></b> REASON FOR TEACHING LESSON.</p> <p><b><u>APPROACH</u></b> THE LESSON WILL BE TAUGHT IN THE FOLLOWING STAGES. (STRESS SAFETY)</p> <p><b><u>CONTROL STATEMENT</u></b> WHEN I DO DEMONSTRATE, YOU <b><u>WATCH AND LISTEN</u></b>. DO NOT DO ANYTHING UNTIL I SAY SO.</p> <p><b><u>TEST</u></b> EXPLAIN TEST DETAILS. SILENT DEMO/FINISHED PRODUCT.</p> <p><b><u>SAFETY</u></b></p>	<p style="text-align: center;"><b>O.B.</b></p> <p style="text-align: center;"><b>PERFECT DEMO</b></p> <p style="text-align: center;"><b>SHOW FINISHED PRODUCT</b></p>

<p><b>3 MIN</b></p>	<p><b>EMPHASIZE SAFETY RULES AND REGULATIONS AS APPLICABLE TO THE LESSON.</b></p> <p style="text-align: center;"><b><u>BODY</u></b></p> <p style="text-align: center;"><b><u>STAGE 1</u></b></p> <p><b><u>INTRODUCTION</u></b></p> <p><b>INTRODUCTION TO THIS STAGE.</b></p> <p><b><u>STEP 1 – NAME OF TEACHING STEP</u></b></p> <ul style="list-style-type: none"> <li>- DEMO STEP.</li> <li>- EXPLAIN STEP.</li> <li>- HAVE TRAINEES IMITATE STEP.</li> <li>- SUPERVISE THEIR PERFORMANCE OF STEP.</li> </ul> <p><b>ANY QUESTIONS?</b></p> <p><b>DO IT!</b></p> <p><b><u>STEP 2 – NAME OF TEACHING STEP</u></b></p> <ul style="list-style-type: none"> <li>- AS PER STEP 1</li> </ul> <p><b><u>STEP 3 – NAME OF TEACHING STEP</u></b></p> <ul style="list-style-type: none"> <li>- AS PER STEP 1</li> </ul> <p><b><u>STEP 4 – NAME OF TEACHING STEP</u></b></p> <ul style="list-style-type: none"> <li>- AS PER STEP 1</li> </ul> <p><b><u>STAGE 1 – PRACTICE (AT LEAST ONCE)</u></b></p> <p><b>ALL THE STEPS IN STAGE 1.</b></p> <p><b>TRY IT BY YOURSELF!</b></p> <p><b>DO IT AGAIN!</b></p>	<p style="text-align: center;"><b>DEMO</b></p> <p style="text-align: center;"><b>EXPLAIN</b></p> <p style="text-align: center;"><b>IMITATE</b></p> <p style="text-align: center;"><b>SUPERVISE</b></p>
<p><b>11 MINS</b></p>	<p style="text-align: center;"><b><u>STAGE 2</u></b></p> <p style="text-align: center;"><b><u>INTRODUCTION</u></b></p> <p><b><u>STEP 5 – NAME OF TEACHING STEP</u></b></p> <ul style="list-style-type: none"> <li>- AS PER STEP 1.</li> </ul> <p><b>REMAINDER OF STEPS, AS PER STEP 1.</b></p>	<p style="text-align: center;"><b>CHECK!</b></p> <p style="text-align: center;"><b>CHECK!</b></p> <p style="text-align: center;"><b>CHECK!</b></p> <p style="text-align: center;"><b>AS PER</b></p> <p style="text-align: center;"><b>STAGE 1</b></p>

<p><b>20 MINS</b></p>	<p><b><u>STAGE 2 – PRACTICE</u> (AT LEAST ONCE)</b></p> <p><b>ALL THE STEPS IN STAGE 2.</b></p> <p><b>TRY IT BY YOURSELF!</b></p> <p><b>DO IT AGAIN!</b></p> <p><b><u>TOTAL PRACTICE</u> (AT LEAST ONCE, MORE IF TIME PERMITS)</b></p>	<p><b>CHECK!</b></p> <p><b>CHECK!</b></p>
<p><b>24 MINS</b></p>	<p><b>BOTH STAGES COMBINED AND PRACTICED AS ONE LONG SEEQUENCE</b></p> <p style="text-align: center;"><b><u>CONCLUSION</u></b></p> <p><b><u>REVIEW</u></b></p> <p><b>STRESS THE IMPORTANT POINTS FROM THE LESSON.</b></p> <p><b>“REMEMBER, YOU MUST...”</b></p>	
<p><b>25 MINS</b></p>	<p><b><u>REMOTIVATION</u></b></p> <p><b>RE-USE THE WHY OF THE INTRODUCTION AND STRESS THE IMPORTANCE OF THE LESSON.</b></p> <p><b>IN FUTURE LESSONS YOU WILL LEARN...</b></p>	





<p>18 MINS</p>	<p style="text-align: center;"><b><u>STAGE 2</u></b></p> <p style="text-align: center;"><b><u>INTRODUCTION</u></b></p> <p><b>TP4 – (STAGE 2 INSTRUCTED AS PER STAGE 1)</b></p> <p><b><u>CONFIRMATION OF STAGE 2</u></b></p> <p style="text-align: center;"><b><u>FINAL SUMMARY</u></b></p>	<p style="text-align: center;"><b>SHOW VA'S</b></p>
<p>19 MINS</p>	<p><b>WE HAVE JUST COVERED...</b></p> <p><b>ARE THERE ANY QUESTIONS ON THE ENTIRE LESSON?</b></p> <p style="text-align: center;"><b><u>CONCLUSION</u></b></p> <p><b><u>REVIEW</u></b></p> <p><b>TODAY WE HAVE COVERED...</b></p> <p><b>CRITICAL FACTORS OR HIGHLIGHTS ARE...</b></p> <p><b>REMEMBER...</b></p>	<p style="text-align: center;"><b>SHOW ALL TP'S</b></p>
<p>20 MINS</p>	<p><b><u>REMOTIVATION</u></b></p> <p><b>RE-USE THE WHY OF THE INTRODUCTION AND STRESS THE IMPORTANCE OF THE LESSON. IN FUTURE LESSONS YOU WILL LEARN...</b></p>	